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CONTRASTS IN VOCAL PEDAGOGY: 1940 AND 1970

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CHAPTER I

INTRODUCTION

The purpose of this study is to identify contrasts and to indicate changes which have occurred in methods of teaching singing since the 1940's. The methodological considerations will be restricted to those which are relative to the processes of respiration, phonation, resonation, and modulation. This work will be concerned with a variety of pedagogical approaches.

Teachers of singing as well as others who are familiar with singing are aware of the extent to which changes in pedagogical concepts have affected the general state of voice pedagogy during the past quarter of a century. Unfortunately, many teachers steeped in traditional teaching techniques are often unaware of newer and sometimes more accurate methods and information regarding pedagogy. On the other hand, teachers with more recent training many times fail to comprehend statements and procedures used by those who cling to dicta of the past. The result is often a lack of mutual respect among teachers of singing. On occasion this has led to open animosities which tend to be damaging to the entire profession. It can be stated categorically that each group is likely to continue to be antagonistic to the other unless they

respond to the changes that have occurred in pedagogical procedures since the 1940's. The information found in this study could provide the aforementioned teachers of singing an opportunity to seek common ground for communication of ideas and the achievement of mutual understanding.

Training the Singing Voice by Victor Alexander Fields serves as a synthesis of vocal pedagogy before 1947. Fields' book is a highly respected, authoritative source book presenting an analysis of the working concepts which formed the basis of vocal pedagogy prior to its publication in 1947. Walter Allen Stults, who has served as a reviewer for The National Association of Teachers of Singing Bulletin since 1956, describes the book thus:

> . . . unique in concept and comprehensive in scope. . . . Its title might well have been an Anthology of Vocal Concepts, consisting, as it does, of an "analytical study and comparison of many recent contributions to vocal pedagogy. . . ." He has made available for the professional singers and teachers, as well as amateurs and advanced students, a vast reference symposium to which they may refer for extended comment on any phase of vocal technic whether mental, physical, emotional or musical in genesis.[1]

Even though the contents of Fields' book were gleaned from contributions to vocal pedagogy during the fifteen years prior to its publication, the teachers cited by Fields drew heavily on current experience and practice, much of which was based on the past going as far back as the time of Caccini, the turn of the seventeenth century. One objective of Fields' book was to present a survey and comparison of the many recent views about the field of vocal pedagogy to facilitate appraisal of old and new teaching methods. Both pedagogy and research could

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[1]Walter Allen Stults, "Bookshelf," The NATS Bulletin, XXIII (May, 1957), p. 21.

benefit from the juxtaposition and classification of the principal ideologies and methodologies pursued by the singing profession.[2] Another aim of his book was to "furnish the teacher of singing counsel and cautions of his contemporaries from a range of knowledge and experience wider than his own. Needless trial and error experiences might be obviated and the teaching profession as a whole provided with a purposive viewpoint."[3]

The National Association of Teachers of Singing (hereinafter NATS) is presently the largest single organization of singing teachers in the world. The NATS Bulletin[4] is notably the only periodical of NATS used for the expression of vocal concepts. The use of The Bulletin as a primary source of recent views about singing may be easily justified, for there is currently no other periodical devoted exclusively to the problems of the singer and singing techniques. The objectives of the association as expressed in the first publication of The Bulletin in 1944 were:

> . . . to establish and maintain the highest standards of ethical principles and practices in the profession of the teaching of vocal art; to establish and maintain the highest possible standards of competence in said profession; to conduct and encourage research and to disseminate information to the profession at large; and encourage effective cooperation among vocal teachers for their welfare and advancement.[5]

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[2]Victor Alexander Fields, Training the Singing Voice (New York: King's Crown Press, 1947), p. 1.

[3]Ibid.

[4]For the sake of brevity The NATS Bulletin will be referred to as The Bulletin in the text and footnotes.

[5]"Pertinent Selections from the Association By-Laws," The Bulletin, I (October, 1944), p. 4.

The charter members of NATS were teachers of singing who through cooperation and research sought to establish a more respected profession. Homer G. Mowe, the first editor of The Bulletin, wrote that it was necessary to establish a means of communication among teachers which would help them become better acquainted by learning of the various interests, aims, and activities of their colleagues. It was also noted that the geographical distribution of the members imposed a serious obstacle to conventions; hence, the publication of a periodical would seem vital to the attainment of cooperation among teachers of singing.[6]

In the first issue of The Bulletin, the president of NATS, John C. Wilcox, indicated that there was need for a reconciliation among the various pedagogical approaches when he stated:

> Your officers and various committees are working on projects which will, in due time, result in the issuance of material of great interest and value to our members and the voice teaching profession at large. A single statement of Fundamental Laws and Pedagogic Precepts, which will reflect authentic information from the field of scientific vocal research and a reconciled pedagogic approach, is one of these projects. . . . While the actual preparation and publication of such material must, of necessity, be the task of our officers and special committees, it is recognized that many members outside the "official family" are fitted to make valuable contributions. . . . One of the principal functions of NATS is to provide a medium for such an exchange of ideas. I cordially issue a standing invitation to any and all members to submit to me, at any time, ideas or opinions which they believe would be a helpful contribution to our program of education, fellowship and professional betterment.[7]

Several months later Wilcox began to implement the stated objectives of the association by appointing a research committee to make a compilation of significant research relative to singing, to keep in touch with all

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[6]Homer G. Mowe, "Editorials," The Bulletin, I (October, 1944), p. 2.

[7]John C. Wilcox, "Greetings," The Bulletin, I (October, 1944), p. 1.

known research projects, and subsequently report such information to the membership through The Bulletin. Wilcox also appointed an editorial committee to compile educational data and edit the information in a way which would reflect the opinions of members who contributed to the discussion of the materials.[8]

In December, 1945, another of the objectives of the association was attained by the publication of "a statement of the laws and precepts about which there should be universal agreement among teachers of singing."[9] This statement, under the heading of "Training the Vocal Instrument," was prepared and presented by the editorial committee to the members of NATS for their comment and suggestions. The statement listed and discussed specific views about objectives and techniques for their attainment under the headings of "posture," "breathing," "release," "resonators," "vowel and consonant formation," "pronunciation and articulation," and "diction." The chairman of the editorial committee, S. M. K. Gandell, in addition to pointing out that "Training the Vocal Instrument" was merely an attempt to express the physical factors upon which all good vocal instruction should be based, also wrote, "If we could find ourselves in general agreement with the conclusions arrived at in this statement, we shall have taken a good step forward toward the attainment of one of the purposes contemplated by NATS."[10] All of the

[8]John C. Wilcox, "The President Comments," The Bulletin, I, (April, 1945), p. 1.

[9]"Training the Vocal Instrument," The Bulletin, II (December, 1945), p. 1.

[10]Ibid., p. 4.

members of NATS were then invited to make suggestions for revisions concerning any part of the statement with which they disagreed.

Thus, in the first and following numbers of The Bulletin an appeal was made to the membership to contribute its ideas about common vocal problems with the assurance that these questions or answers would be published in The Bulletin. The appeal caused wide interest and resulted in discussions concerning vocal concepts in succeeding issues. "Training the Vocal Instrument" served as a reference point from which teachers began to express themselves either pro or con. Outstanding addresses presented at conventions or summer workshops by competent authorities in vocal matters, including research findings in vocal science and related fields, were published in succeeding volumes of The Bulletin, thus enhancing its value as a resource.

Related Studies

A careful search shows that this study partially intrudes in areas covered by two other studies, one by George E. Thompson, Jr., and one by V. A. Fields. Thompson's thesis, "The Role of Precepts and Imagery in Vocal Instruction," is a study of precepts and imagery used in the field of voice culture with the purpose of determining their physical or psychological basis.[11] In his study Thompson shows that in the teaching of singing, "from the seventeenth century to the present, frequent use has

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[11] George E. Thompson, Jr., "The Role of Precepts and Imagery in Vocal Instruction" (unpublished Master's thesis, University of Southern California, 1940).

been made of precepts and imagery in the effort to manage the vocal instrument."[12] There is no direct encroachment here on Thompson's thesis because not only does his investigation precede the time period of this study but his approval of the use of imagery as a valid technique reinforces the conclusions listed at the end of each chapter.

Fields' Training the Singing Voice has three general purposes: "to survey and correlate sources of bibliographic information on methods of training the singing voice, provide a core of organized information for the use of all teachers of singing, and to provide an orientation and background for research in this and related fields."[13] Fields organizes the major topics of his study into two sections--theoretical and methodological considerations. Under the heading of "Theoretical Considerations," he first defines terminology in each chapter and then gives the principal theories concerning the nine main areas of investigation--Pedagogy, Breathing, Phonation, Resonance, Range, Dynamics, Ear Training, Diction, and Interpretation. Following the presentation of theories he includes a brief outline of physiological properties or factors involved in the discussion of the individual subjects.

Fields subdivides the topic of "Methodological Consideration" into two main divisions--the Psychological Approach and the Technical Approach. In each chapter Fields graphically illustrates the number of views expressed concerning individual topics. At the end of each chapter

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[12] Ibid.

[13] Fields, Training the Singing Voice, p. 2.

he includes a summary and interpretation of findings. His conclusions indicate that there were at the time no complete texts or books on singing which treated the theories and methodologies of singing in a thorough way. This study differs from Fields' study by limiting the area of investigation to contrasts and changes which have taken place in the methodological approaches related to the teaching of singing since 1947.

Definition of Terms

In order to avoid misunderstanding by the varied definitions and uses of terminology, certain terms which are used frequently in this study shall be defined.

Acoustics is the science of sound or "an area of study concerned with the cause, nature, and phenomena of vibrations that affect the organs of hearing."[14]

Approach is used to mean a way of gaining access to the understanding of a subject and refers more to the "psychological approach" than the "logical approach."[15] The psychological approach is often preferred because it implies that the subject matter is organized in a manner to match the understanding of the learner rather than according to a structure inherent in the subject.[16] A logical organization of an area of knowledge is postponed until a more advanced stage of comprehension is achieved.[17]

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[14] Carter V. Good, ed., Dictionary of Education, 1959, p. 7.

[15] Ibid., p. 325. [16] Ibid. [17] Ibid.

Concept is "a thought, an opinion, or a mental image."[18]

Direct means to guide with advice or regulate the course of conduct by management and controls.[19] In this study the term is associated with a method of teaching by which objectives are reached by conscious effort.

Empirical, a term which is "derived from or based on experience or observation: (2) in a derogatory use, sometimes opposed to scientific, in the sense that one does something because it works without being able to explain why it works."[20]

Indirect is a word which is associated with the term "approach" and refers to "a method of teaching by which the ultimate objectives are reached by a somewhat oblique or roundabout course."[21] In this study the term "Indirect Approach" is often used as a synonym for "psychological" or "empirical approach."

Method refers to a "settled kind of procedure, usually according to a definite, established, logical or systematic plan."[22] In the definition of "method" there is also some relationship between the educational terminology of "problem-solving," "goal-seeking," and "objective" methods. For instance, the definition includes the concept of dealing with problems but not with hypothetical solutions. It includes the concept of the

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[18]Ibid., p. 118.

[19]Philip Babcock Gove, et al., Webster's Third New International Dictionary, 1961. (Hereinafter referred to as Webster's Dictionary.)

[20]Good, Dictionary of Education, p. 199.

[21]Ibid.

[22]Gove, Webster's Dictionary.

student and teacher working together to attain and evaluate progress toward goals. Furthermore, the definition of the term "method" includes the concept of being a procedure which is "based on the use of accurately ascertained data;"[23] but departs from the remainder of the definition of "objective method," which prohibits any personal opinions or preconceived ideas.[24]

Pedagogy is the "art, practice, or profession of teaching."[25] The term is also used to mean the "systematized learning or instruction concerning principles and methods of teaching and of student control and guidance."[26]

Physiology is the "science dealing with the functions of living organisms or their parts."[27]

Process is "a systematic series of actions directed to some end."[28]

Psychological Approach is the first of two methodological considerations used in Fields' book:

> Inasmuch as the psychologist believes in the sovereignty of the mental processes in controlling and coordinating human behavior, the psychological approach in vocal teaching is predominantly an indirect approach through mental rather than physical training. . . . In this approach, the voice is trained largely through meaningful situations intended to facilitate learning without exciting the conscious or voluntary control of the functions involved.[29]

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[23]Good, Dictionary of Education, p. 371.

[24]Ibid. [25]Ibid., p. 387. [26]Ibid.

[27]Gove, Webster's Dictionary.

[28]Ibid.

[29]Fields, Training the Singing Voice, p. 62.

Technical Approach is the second of two methodological considerations used in Fields' book: "In contradistinction to the psychological approach is the more direct or technical approach, emphasizing the conscious manipulation and control of the processes and techniques involved in the vocal act."[30]

Organization of the Study

This study is a compilation, analysis, and interpretation of views expressed in The Bulletin by teachers of singing and researchers concerning methods of respiration, phonation, resonation, and modulation. Fields' outline of each subject served as a starting point for this study and was used until a departure was indicated by findings extracted from The Bulletin. These findings reveal not only changes but contrasts in vocal pedagogy. Among more prominent contrasts are those evident in the methodological approaches, referred to as the Indirect and Direct Approaches. Conclusions concerning topics in Fields' outline are presented, followed in many cases by information concerning changes in concepts revealed by scientific research. Techniques showing changes in concept as well as those with no change are illustrated by views supporting either indirect, direct, or various blends of the two approaches related to the methodologies aforementioned.

Chapter one serves as an introduction and chapter two deals with vocal pedagogy in general, describing and tracing the historical origin of the two main methodological approaches. Chapter three is a study of the methodologies of respiration and includes discussions concerning the

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[30] Ibid., p. 63.

topics of "Natural Methods of Breathing," "Posture," and "Breath Support." The chapter reveals that many advocates of the psychological approach began to re-interpret vocal concepts passed down from the bel canto school to include "direct" instructions concerning the processes of respiration. Clarification of terminology by the scientific group helped to bring about better understanding and cooperation between teachers of the opposing approaches.

Chapter four deals with phonation and shows how a combination of approaches has been brought about primarily by the re-defining and acceptance of the term "coordination." The new definition shows "coordination" to be a process of achieving phonation with controlled effort coupled with vocal freedom. This balance is shown to be necessary in achieving proper oral controls, lingual positions, palatal controls, conditions for the open throat, laryngeal positions, and devices for improving attack.

Chapter five contains various meanings associated with the term "resonation." Since the knowledge of acoustical and physiological factors often dictates the methods needed to acquire desirable quality, the clarification and description of both factors are presented together. Such terms as "nasal resonance," "focus," and "resonators," are presented with related scientific findings and the methodologies associated with them.

Chapter six discusses the process of modulation which is often referred to as "range." The classification of voices is discussed, suggesting the dangers of classifying voices too hastily. The chapter primarily deals with the description, history, and contrasting methods of blending vocal registers.

Chapter seven consists of interpretation of findings resulting from the study together with a summary statement and suggestions for further studies.

CHAPTER II

HISTORICAL ORIGINS OF INDIRECT AND DIRECT APPROACHES

For years the methodology of vocal pedagogy has been primarily represented by two opposing approaches, the Indirect and the Direct. The exclusive use of one of these two approaches continues to be advocated by many teachers of singing, accompanied by the idea that the opposing approach is at least ineffective if not destructive. It is the purpose of this chapter to describe the general characteristics and trace the historical origin of the Indirect and Direct Approaches.

Indirect Approach

Although evidence indicates that the art of singing reached a degree of virtuosity earlier than the seventeenth and eighteenth centuries, commonly referred to as the "Golden Age of Singing" or "Bel Canto Period," little was known about the techniques used until then. Pedagogy based on techniques thought to have originated during the bel canto period generally has been considered as the Indirect Approach to vocal study.

According to Philip Duey, the goal of singing in the bel canto period was "beauty of tone together with the highest possible degree of virtuosity."[1] The technical perfection attained by singers of this

[1]Philip A. Duey, "Vocal Ornamentation--A Survey," The Bulletin, XI (September, 1954), p. 13.

period could hardly have been achieved without a good deal of vocal independence. Musicians are virtual slaves to the score today, but the singers of the bel canto period rarely performed the music as it was written. The singer of that day was evaluated first by improvisational ability and second by his tone production.[2] As might be expected, freedom of improvisation led to excesses with the result that teachers of the time began to express concern about the need for restraint. For example, Pier Francesco Tosi, a most influential early writer on singing, wrote toward the end of his career that ornaments in the exposition of da capo arias should be limited. In his famous Observations on the Florid Song[3] written in 1723, Tosi frequently urged the use of good judgment regarding restraint in the variation skills. Consequently, improvisation rapidly lost ground after 1800 because teachers in general began to extol the virtues of restraint while the public began to show its disapproval of excess in the art of singing.[4]

In discussing the "Golden Age of Singing," Arthur Gerry mentioned that Alessandro Scarlatti was a most noted early bel canto teacher. Gerry continued by stating: "Although we think of him as a composer, the truth is that during his lifetime he was very famous as a singer and a teacher of singing. In his declining years he had a pupil, Niccolo Porpora . . . [who] became perhaps the most famous teacher of singing of all time."[5]

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[2]Ibid., p. 17.

[3]Pietro F. Tosi, Observation on the Florid Song, cited by Duey, "Vocal Ornamentation--A Survey."

[4]Duey, "Vocal Ornamentation--A Survey."

[5]Arthur Gerry, "Pathways to Vocal Pedagogy," The Bulletin, XI (May, 1955), p. 7.

Vennard of the University of Southern California, in an article about the history of vocal pedagogy, spoke of Porpora thus: "If teachers are to be judged by their famous products, Niccolo Porpora is probably the greatest of the Golden Age because of his pupils Caffarelli, Farinelli, Porporino, Senesino, and Tosi."[6]

When stimulated by the successes of famous artists who preceded them, many teachers attempted to discover as much as possible about past traditions and methods which were used to perfect such voices. Much of the information was passed from teacher to student while guarding against the possibility of rival students or teachers gaining the information by refusing details even to their own students. This secrecy contributed to the formation of various cults led by people who were supposed to have had these "secrets" passed on to them. Gerry maintains that it is logical to believe that methods from the bel canto period have been passed on to teachers of the twentieth century. It is argued that since Niccolo Porpora died in 1766, it is reasonable to believe that some of his students were teachers of singing in the first part of the nineteenth century and could have passed Scarlatti's principles of vocal training to others who were teaching within the past hundred years. Thus, it is claimed that the scales and exercises used by Niccolo Porpora were substantially the same as those used by Caruso.[7] It is also held that one of the main factors which led to supremacy of the old Italian school of

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[6]William Vennard, "A Message from the President," The Bulletin, XXII (October, 1965), p. 2.

[7]Gerry, "Pathways to Vocal Pedagogy."

singing was that of unanimity. Throughout this period of about two hundred years, most recognized and legitimate teachers taught in the same manner and with a common language advantage.[8]

Others extolling the virtues of the "Golden Age" maintain that the techniques of yesterday are about the same as those used today. A typical expression of this view made by the NATS Committee on Vocal Education in response to questions addressed to "Quiz Cove" of The Bulletin states:

> As nearly as we can determine from the records of history, the singing techniques of the Golden Age [17th-18th] centuries were about the same as they are at present, that is wherever artistic singing is taught. Seven basic skills were mastered:
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> 1. Pure intonation [pitch accuracy].
> 2. Perfect legato at all intervals.
> 3. Correct phrasing.
> 4. Great breath support, flexibility and endurance for long florid passages.
> 5. Perfect messa di voce (gradual swelling and diminishing of any tone.)
> 6. Purity of vowel sounds in all pitches.
> 7. Clear and exact pronunciation of syllables and words.
>
> Add musicianship to these seven objectives and you have the recipe for artistic singing in any age. That's it in a nutshell.[9]

Those who favor the Indirect Approach teach singing using such terms as "naturalness," "feel," "subconscious," "spontaneous," "involuntary," and "automatic reflex actions." Fields refers to the Indirect Approach as the Psychological Approach while describing its advocates as believers in the sovereignty of the mental processes in controlling and coordinating human behavior.[10] He also maintains that "the voice is trained largely through meaningful situations intended to facilitate

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[8] Ibid.

[9] "Quiz Cove," The Bulletin, XVII (May, 1961), p. 28.

[10] Fields, Training the Singing Voice, p. 62.

learning without exciting the conscious or voluntary control of the functions involved."[11] Fields continues his description by saying: "The singing voice is treated as an instrument of self expression and ear training methods are employed as a means of promoting the automatic response of the vocal instrument to concepts of beautiful tone."[12]

One of the most important tools used by the "empirical teacher" is "imagery." William Vennard, in an article describing the various pedagogic approaches, links the term "imagery" with the Indirect or Empirical Approach and indicates further that "imagery" is also one of the basic tools of the Gestaltist teacher. Vennard also includes the Poetic Approach in the general category of the Indirect Approach because the poet is a master of figures of speech and subjective language. Some of the old-fashioned figures of speech used to describe tone are terms such as "warm," "edgy," and "free," which are far from being literal in meaning. In discussing these terms he states: "We not only use these terms, but we substitute gestures for them, like the up-and-over gesture."[13] There are other pseudo-scientific terms used by those practicing the Poetic Method such as "focus," "resonance," "fundamental tone," and "placement." In discussing "imagery" and "figures of speech," it is suggested that one must distinguish between literal fact and implied comparison.

> Similes are better than metaphors. A metaphor is an "implied" comparison which may be confused with a statement of fact. A simile always has the important words "like" or "as if." . . . . For communication to be effected by a figure of speech it must refer to a

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[11] Ibid., p. 63. [12] Ibid.

[13] William Vennard, "A Message from the President," The Bulletin, XXI (February, 1965), p. 1.

> common experience. . . . The basic premise of the pupil-teacher relationship is that the master has experienced something which the neophyte has not.[14]

The goal of the "psychological teacher" is to establish the right mental concept by means of "selecting certain elements of past experience, experimenting with various new experiences, and deepening the most desirable behavior patterns by repetition and verbalization, which will be partly factual but also necessarily figurative."[15]

Direct Approach

According to the Harvard Dictionary, scientific study of the vocal apparatus and application of its use in singing increased during the nineteenth century.[16] Singing teachers who incorporated scientific findings in their teaching techniques were labeled as "mechanistic" and advocates of the Direct Approach.

Agricola (1720-1774) and Mancini (1716-1800) were among the teachers of singing who attempted to support their empirical doctrines with scientific knowledge before the nineteenth century.[17] Another great teacher was Bontempi (1624-1705), who indicated a use of scientific findings in his teaching procedures but insisted at the same time that "experience" had precedence over "reasoning."[18]

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[14] Ibid. [15] Ibid., p. 13.

[16] Willi Apel, Harvard Dictionary of Music, 1951.

[17] Vennard, "A Message from the President," October, 1965, p. 21.

[18] Philip A. Duey, Bel Canto in its Golden Age (New York: King's Crown Press, 1951), p. 127.

Manuel Garcia (1805-1906) laid the foundation for the expansion of curiosity about the scientific investigation of the vocal mechanism in the nineteenth century. Vennard, having a deep interest in Garcia, said: "The Golden Age led up to him, and the various schools of thought existing today may be seen as accommodations to his discovery of the laryngoscope."[19] Garcia's method books contain the same sort of exercises for agility and musicianship as can be found in other so-called bel canto manuals of his time. The main difference between Garcia's book and other manuals of his day is Garcia's realistic and concise description of the vocal mechanism. Adverse results of Garcia's invention of the laryngoscope were, as Garcia's pupil Salvatore Marchesi, describes: "Thousands of undesirable meddlers seized upon the subject and brought about confusion and, as a consequence, the inevitable decline of the finest of all the fine arts."[20] In other words, many teachers of singing began experimenting with the "mirror device" while on the other hand medical men began teaching singing. Garcia did not see anything further to be gained by the use of the laryngoscope beyond satisfying the curiosity of those who might be interested in seeing the vocal cords in operation.

We are also indebted to Garcia for the expression coup de glotte. Garcia defined coup de glotte as a method of beginning a tone correctly but warned against the possibility of interpreting the stroke of the glottis as a cough.[21] Regardless of Garcia's intentions the meaning was

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[19]Vennard, "A Message from the President," October, 1965, p. 1.

[20]William Vennard, "A Message from the President," The Bulletin, XXII (December, 1965), p. 1.

[21]William Vennard, Singing, the Mechanism and the Technic (New York: Carl Fischer, Inc., 1967), p. 44.

immediately corrupted by those whose knowledge of the larynx was insufficient to understand what Garcia meant by his writings.[22] Vennard has done much to defend Garcia by showing both his mistakes and his contributions to vocal pedagogy today. Garcia was unique in that he was not content to understand physiology by teaching experiences alone but was curious enough to experiment and to record his findings.

Another reason the nineteenth century is considered to have been the period beginning the scientific study of the voice was the appearance of findings by H. L. F. Helmholtz, who is now thought of as the "father of modern acoustics." Helmholtz's important treatise, On the Sensations of Tone, was first published in 1885. Helmholtz was a German physicist who supported a theory which, simply stated, means that the resonators (e.g., mouth and throat) merely augment harmonics which already have been produced by the vibrator. This has come to be called the harmonic theory.[23] Although the opposing "puff theory," supported by acoustical physicists such as Willis, Hermann, and Scripture, was based upon the idea that the vibrator of the voice emits puffs which only determine the pitch of the tone and excite the resonators which add their own harmonic or inharmonic frequencies, most authorities have minimized the differences between the two theories and consider both necessary to furnish a full understanding of resonance.[24] Other scientists who continued to investigate the vocal mechanism and the related areas of singing at the turn of the century were Emil Benke, Morell Mackenzie, Lennoxe Brown, Pierre Bonnier, Floyd Muckey, and the Nadolecznys. These scholars

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[22] Ibid., p. 45. [23] Ibid., p. 238. [24] Ibid.

brought out books that were as objective and accurate as possible considering the scientific knowledge which was available at the date of their publications.[25]

Another outstanding advocate of a more scientific approach to the teaching of singing was William Shakespeare, who in 1898 discussed physiology based upon ideas of Huxley, the leading contemporary English authority.[26] Shakespeare continually quoted his teacher, Lamperti, and other Italians of an earlier day, but he did not mention Garcia, preferring to credit Mackenzie.[27] Chronologically, the next most famous name that could be included with those who advocated the scientific method was a medical doctor, Mario Marafioti, who wrote Caruso's Method of Voice Production, which was published in 1922. However, Marafioti's book is not as scientific as might be expected from a medical authority. His book is a mixture of both the scientific and empirical approaches. A more important advocate of the "scientific approach" was Frantz Proschowsky, who developed and patented an auto-laryngoscope in Germany. In his book, The Way to Sing, published in 1923, he states that the larynx is the cause of the tone and the vibratory sensations are effects.

Another scientific teacher was Douglas Stanley. Stanley's first book, The Science of Voice, published in 1929, was followed by Voice Production and Reproduction in 1933 and Your Voice in 1945. According

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[25]Vennard, "A Message from the President," December, 1965, p. 2.

[26]William Shakespeare, The Art of Singing. First printed in England, 1898; second printing (Bryn Mawr: T. Presser Co., 1921).

[27]Vennard, "A Message from the President," December, 1965, p. 2.

to Vennard, Stanley was a most original thinker who scorned all of his colleagues. He studied singing in London but seemed to be unaware of influences from either Shakespeare or Garcia. Stanley quickly gained the reputation of being an "arch-scientist" with the "psychological teachers" who vigorously resisted his "scientific approach." Apparently Stanley's insistence that all voices had a three-octave range and the use of direct manual manipulations of the larynx were the main causes of disapproval by many "psychological teachers." Stanley, resenting rising criticism by his colleagues, struck back at them in his last two books, ridiculing a number of authors by name. Later, in an appendix written in 1957 to his last book, Stanley retracted some of his radical methods. Vennard, in evaluating Stanley, said, "There are many authors who have made fewer mistakes than Stanley, but they have also enunciated fewer important truths and have exerted far less influence."[28] Vennard continued by stating: "It might be a surprise to know how many NATS members are indebted to Stanley. One who acknowledged it was our first president, John C. Wilcox. His book, The Living Voice, 1935, is a safe and sane exposition of Stanley concepts."[29]

Those who favor the Direct Approach to teaching singing speak of the techniques in terms of "controls," "management," and "deliberate physiological changes." Fields refers to the Direct Approach as the Technical Approach and describes it as being directly opposite of the Psychological Approach. His description of the teacher who uses the Technical or Direct Approach is explained as one who teaches by means of

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[28] Ibid., p. 3. [29] Ibid.

emphasizing the conscious manipulation and control of the processes and techniques involved in the singing act. Furthermore, the teaching procedures employ preparatory technical exercises in which the mechanical repetitive execution of specific skills becomes an essential feature.[30] The advocates of the Direct Approach have not been satisfied with the exclusive use of "indirect methods," which are not only unscientific but at times are in error. Illustrations of such errors occur later in this study. Many favoring the Direct Approach have sought physiological reasons and processes for using particular techniques.

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[30]Fields, Training the Singing Voice, p. 63.

CHAPTER III

RESPIRATION

Since most teachers of singing consider the effective control of respiration a basic technique necessary for agreeable singing, they continually evaluate respiratory development. The purpose of this chapter is to investigate the methods related to the control of respiration, showing not only the contrasting concepts but changes which lead to an increased acceptance of a pedagogy based upon the various blends of the Indirect and Direct Approaches.

Fields discussed "Methods of Cultivating Breath Control" under the headings of Psychological and Technical Approach. The views expressed in Fields' book concerning the topic "Natural Breathing Advised," under the heading of Psychological Approach, generally indicate agreement with the Indirect Approach. Although the views concerning the first topic of "Posture" were consistent with the meaning of Technical Approach, there were so many inconsistent views concerning "Control of Organs" and "Diaphragmatic Controls" that Fields found it necessary to introduce the topic "Voluntary versus the Involuntary Approach to Breathing." Fields' conclusions indicate that the opinions were "unevenly divided regarding this controversial topic, there being twenty-four statements in favor of, and eleven against, voluntary control of the breathing organs during

singing."[1] Under the following topic of "Diaphragmatic Controls," thirty-six opinions were gathered, twenty-seven of which favored conscious control of the diaphragm and nine opposing.[2] From this analysis it was clear that the majority were in favor of using the Direct Approach in the areas of "Posture," "Control of the Organs of Breathing," and "Diaphragmatic Controls."

Topics of Fields' outline are presented in this study to show a comparison of current views with those expressed in his book.

Natural Breathing

Fields first lists the topic "Natural Breathing Advised" under the general topic of the Psychological or Indirect Approach. He interprets the term "natural breathing" to mean "breathing that has not been influenced by direct technical training or localized effort. It is a spontaneous, normal and unconscious activity without any attempt at voluntary control; a reflex action."[3] Mowe, explaining his method of teaching correct breathing, also indicates that the student should breathe "naturally," but maintains that there is confusion in the minds of many students concerning the difference between the terms "natural" and "habitual."[4] Mowe proceeds to define the term "natural" as "pertaining to one's nature; not forced or artificial"[5] and the term "normal" as

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[1]Fields, Training the Singing Voice, p. 83.

[2]Ibid., p. 85. [3]Ibid.

[4]Homer G. Mowe, "Methodology and Terminology," The Bulletin, IX (October, 1952), p. 14.

[5]Ibid.

meaning "in accordance with nature, not ideal. (The last two words point to the need for a new term to describe the breathing for singing, or else we must redefine natural and make it mean ideal)."[6] This statement by Mowe is an attempt to clarify terminology which serves as an important procedure in bringing about a partial reconciliation between opposing schools of methodology.

Some contributors to The Bulletin were very specific about "Natural Breathing" and advocated a strict Indirect Approach without compromise. Walter Golde states that "since the diaphragm works the same way twenty-four hours of the day, we must never disturb its action."[7] Leroy Lewis cites Fillebrown thus: ". . . breathing for singers is only an amplification of correct daily habits. . . . Singing depends on maintaining the tone on the ordinary breath."[8] George Cox states that, ". . . basically, breathing for singing stems from breathing for everyday living."[9] Bruce Foote notes that, ". . . the nearer we can duplicate the action that takes place in normal exhalation, the freer and more beautiful the tone will be."[10] The teacher who uses a strictly psychological or indirect method to establish objectives of correct breathing often

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[6]Ibid.

[7]Walter Golde, "Cultivated Spontaneity," The Bulletin, VIII (March, 1952), p. 12.

[8]Leroy Lewis, review of Resonance in Singing and Speaking by Thomas Fillebrown, The Bulletin, XVI (December, 1959), p. 25.

[9]George Cox, "A Matter of Semantics," The Bulletin, XVII (October, 1960), p. 16.

[10]Bruce Foote, "New Horizons in the Teaching of Voice Pedagogy," The Bulletin, XIX (February, 1963), p. 22. (Hereinafter referred to as "New Horizons.")

uses imagery terms and phrases or connects the breathing act with certain natural reflexes caused by word associations or physical acts. Mowe suggests the use of common human acts such as sighing, blowing, breathing on a mirror, or inhaling the fragrance of a flower to demonstrate the "natural method" of breathing.[11] Cox uses a similar technique to teach breathing as a continuous movement, i.e., the student is asked to imagine the sensation he might receive if, after a tiring day, he dropped into an easy chair and inhaled deeply with an accompanying sigh. The same thing happens when a person is pleasantly surprised and reacts with an animated response.[12]

Advocates of "Natural Breathing" began to expand the concept to encompass some of the methods of the "direct school" as can be seen in this statement by W. S. Drew: "The object of the singer is to sing, not to breathe. Over-attention to breathing mechanics distracts the singer's attention from the realm of sound production, which demands unceasing vigilance of mind and ear."[13] Drew's use of the term "over-attention" certainly indicates that some attention should be centered upon the act of breathing. Golde adds a new dimension to the term "spontaneity" by including the word "cultivated" before the term which can easily be interpreted as being associated with the Direct Approach. Golde illustrates his point by saying: "We may put the natural breathing on a cultivated

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[11]Mowe, "Methodology and Terminology."

[12]Cox, "A Matter of Semantics."

[13]W. S. Drew, "A Quote," The Bulletin, VII (January, 1951), p. 11.

basis, as will be true of any other gesture found in the realm of spontaneity."[14]

Singing Develops Breathing

Fields uses the topic "Singing Develops Breathing" as his second heading describing the Psychological Approach. He maintains that this principle is a corollary of the "natural breathing method." It is also held that "if breathing is to be ignored by the singing student, the breathing organs will develop their own natural action as part of the act of singing."[15] Significantly, J. Tarneaud and Harry Robert Wilson agree with Fields' statement. Dwyer maintains that Marafioti and Bernard Taylor were also in agreement when they said: "Singing develops breathing, not breathing, singing."[16] Nelli Gardini, a teacher in the bel canto tradition, said essentially the same thing: "Effortless breathing--letting the voice control the breath--not the breath controlling the voice."[17]

Interpretational Controls

Fields lists four component subjects under the heading of "Interpretational Controls." They are "Correct Phrasing," "Synchronization with Music," "Expressional Intent Regulates Breathing," and

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[14]Golde, "Cultivated Spontaneity," p. 12.

[15]Fields, Training the Singing Voice, p. 77.

[16]Edward J. Dwyer, "Concepts of Breathing for Singing," The Bulletin, XXIV (October, 1967), p. 41. (Hereinafter referred to as "Concepts of Breathing.")

[17]Nelli Gardini, "Voice Foundation," The Bulletin, IV (October, 1947), p. 4.

"Other Devices for Improving Breathing." Contributors to The Bulletin commented on each of the four subjects, all of which are associated with the Indirect Approach.

Correct Phrasing

The common denominator among those who support the concept that "Correct Phrasing" is a determining factor in developing breath control is their acceptance of the view that all breathing should be as in natural circumstances. While M. Laudesia seems to support the view that "Singing Develops Breathing," she asserts the converse by noting that the singer needs a breath supply in excess of normal. This need is controlled by an act of balanced resistance determined by the length, rise, and fall of the phrase. Breathing for everyday life is an unconscious act, but in singing the singer must breathe with more awareness to determine pitch, intensity, duration, and emotional color in the phrase.[18] An analysis of Laudesia's statement reveals that she has interpreted the indirect method of achieving breath control by "Correct Phrasing" in terms of a mechanistic teacher. Similarly, relating to the Direct Approach, Oren Lathrop Brown indicates that improper phrasing could cause voice strain for the singer if he (1) attempts too long a phrase on one breath, (2) fails to release adjustments of a completed phrase while breathing for a new one, (3) chooses an improper place to get breath to continue or complete a phrase, or (4) makes an improper

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[18]Sister M. Laudesia, "The Impact of Effective Singing," The Bulletin, XXI (February, 1965), p. 10.

breath preparation in relation to a new pitch or an approaching intensity.[19]

Synchronization with the Music

There were three references made by contributors to The Bulletin concerning the second topic of Fields' outline, "Synchronization with the Music," but Fields lists only two: Perhaps the agreement concerning this concept was so obvious that writers deemed the statement as being one that was accepted without dissent. However, Burton Garlinghouse made a significant statement concerning the subject when he maintained that a singer's breath supply should become an automatic physical response to the rhythm of the music without distorting the rhythmic pattern of the music.[20] Cox compared the automatic physical response of respiration to the action of the conductor thus:

> The preparatory upward motion of his arm, moving smoothly into the downward motion seems to say "breathe-sing." Were the conductor to pause before the downward motion, the choristers' throat muscles would unconsciously constrict to retain the breath. Most poor attacks are caused by a singer pausing between inhalation and phonation.[21]

Expressional Intent as a Regulator

There have been a substantial number of writers before and since Fields' publication who uphold the concept that expressional intent

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[19]Oren Lathrop Brown, "Causes of Voice Strain in Singing," The Bulletin, XV (December, 1958), p. 30. (Hereinafter referred to as "Causes of Voice Strain.")

[20]Burton Garlinghouse, "Rhythm and Relaxation in Breathing," The Bulletin, VII (March, 1951), p. 7.

[21]Cox, "A Matter of Semantics," p. 16.

regulates breathing. Oscar Bennett,[22] as well as Wynn York,[23] and John Lester,[24] mentioned that correct breathing could be accomplished by letting the mood of the music determine the need. Both Lester and Cameron McLean maintained that breathing should be a spontaneous process not measured or operated mechanically.[25] If the singer frees himself from concern as to how he is going to do a thing and concentrates on what he is trying to convey, "there is often a psychological dividend of automatic release of the means to that end."[26] Most of those expressing these views agreed with the concept that breath comes automatically with the desire to express a mood or an idea.

Other Devices for Improving Breathing

Contributors to The Bulletin were in general agreement with the five devices mentioned by Fields as methods of cultivating breath control for singing without local effort. They are laughing, sighing, yawning, panting, and being startled.[27] Only two more devices were added by contributors to The Bulletin. The first is an Indirect Approach given by Golde who says: "We breathe down low, not up high. . . . We examine it

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[22]Theo G. Stelzer, "The Singing You," The Bulletin, VI (December, 1949), p. 8.

[23]Wynn York, "The Use of Imagery in Posture Training," The Bulletin, XIX (May, 1963), p. 6. (Hereinafter referred to as "The Use of Imagery.")

[24]John Lester, "Breathing Related to Phonation," The Bulletin, XIV (December, 1957), p. 27.

[25]Cameron McLean, "What Have You to Declare?," The Bulletin, VII (February, 1964), p. 2.

[26]"Quiz Cove," The Bulletin, XXII (October, 1965), p. 44.

[27]Fields, Training the Singing Voice, p. 80.

best by getting into a thoroughly relaxed state--almost sleepy."[28] The second suggestion by Mowe is definitely a Direct Approach to cultivating breath control. He suggests a controlled breathing exercise for inhaling slowly to a certain count, holding the breath for the same count, and exhaling on the same count.[29]

Postural Controls

Although celebrated teachers of the past have been considered members of the Indirect School, examination of their writings indicates that most of them used predominantly a Direct Approach in achieving correct posture. Occasionally the Direct Approach was augmented by imagery techniques as needed. The old Italian masters viewed the art of singing as the art of breathing. Anthony Guarino, borrowing from Crescentini, said: "This art of breathing may be reduced to the two following axioms; Freedom about the neck and voice above the neck."[30] The freedom referred to suggests that if any physical energy is to be expended it should be concentrated through the torso rather than the neck itself. Guarino continues by quoting some of the direct and indirect suggestions given by Lamperti.[31] Emi de Bidoli, an advocate of the methods handed down from the old masters, interprets the old methods

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[28]Golde, "Cultivated Spontaneity."

[29]Mowe, "Methodology and Terminology."

[30]Anthony Guarino, "Present Day Teacher Reviews Lamperti," The Bulletin, VIII (December, 1951), p. 21.

[31]Ibid. Guarino quotes from Lamperti's book, The Art of Singing According to Ancient Tradition and Personal Experience translated by J. C. Griffith (London: Ricordi, 1877).

in light of expanded knowledge by warning against interpreting the word "relaxation" to mean carelessness of posture. She and others also pointed out that "relaxation" is a relative term and is used to counteract tension and rigidity.

Helen Alberti, in discussing the "Facts concerning the Art of Bel Canto or the Basis of Bel Canto," gives both indirect and direct instruction concerning posture. The Indirect Approach is used when she advises the student to "stand easily with complete relaxed muscles and maintain this freedom from any and all tensions through practice; standing thus, see the exact location of the solar-plexus and loins, feel the breath resting securely on the chest and keep it there."[32] A Direct Approach is indicated when she says: "Send the breath out as fast as possible at all times whether ascending or descending a scale, these conditions must be invariable."[33]

Mowe, in his article entitled "Methodology and Terminology," noted that the first principle listed in the NATS statement, Training the Vocal Instrument, was "posture." Mowe says that the objective of posture is:

> . . . to have the singer in the most favorable position and condition for the singing act. The NATS paper states that "Correct posture is necessary to bring the bone and muscle structure of the body into proper alignment and balance so that it may function normally. An upright spine, which will automatically bring the ribs and breastbone into proper position, with head upright and

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[32]Helen Alberti, "Facts concerning the Art of Bel Canto or the Basis of Bel Canto," The Bulletin, IV (December, 1947), p. 6. (Hereinafter referred to as "Facts concerning the Art.")

[33]Ibid.

> neck muscles free from rigidity, is the essential requisite for good singing posture." This agrees in general, with the teaching of the old Italian masters of Bel Canto.[34]

The NATS statement about posture was first made in 1945 and adopted by the association in 1948 as part of a larger statement dealing with laws and precepts about which there should be universal agreement among teachers of singing. Teachers of singing did agree in general with the NATS statement, but The Bulletin published varying views about the techniques which should be used in acquiring this perfection in posture. Cox[35] describes posture as being the same for stage or street while Louis H. Diercks[36] maintains that good posture is the result of a number of habits and attitudes selected by the individual. Isaac Van Grove warns that too much attention to the subject of posture could result in rigidity which robs the student of the necessary attribute of flexibility.[37] The following subtopics show both differences of opinion and a trend toward agreement.

Chest Position

Under the heading of "Posture" Fields takes up the subject of "Maintaining a Correct Chest Position" and points out that out of thirty-three authors who mention the position of the chest as a factor in

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[34]Mowe, "Methodology and Terminology."

[35]Cox, "A Matter of Semantics."

[36]Louis H. Diercks, "The Importance of Knowing the Voice," The Bulletin, XI (February, 1955), p. 6.

[37]Isaac Van Grove, "The Keynote Address," The Bulletin, XXV (February, 1969), p. 8.

postural control, "all but four favor the maintenance of a high and stationary chest position for singing."[38] The discussion of the position of the chest quite naturally included the physiological factors involved in achieving the correct chest position. The NATS statement, Training the Vocal Instrument, reads:

> In the act of inhalation, the lower ribs will spread outward and upward, the front wall of the upper abdomen will expand outward, and the back muscles will slightly expand the ribs at this place. This expansion should remain in the pattern of a lateral spread of the ribs and abdominal walls--not an upward lift.[39]

In an article printed in a 1947 issue of The Bulletin, Edward Molitore took exception to the preceding view when he said that the NATS pronouncement was "at variance with the actual facts governing the act of respiration for singing."[40] Molitore maintained that the upper ribs did move upward and did not spread out during the act of breathing for singing.[41] In the next issue of The Bulletin, Wilcox disagreed with Molitore's contentions by upholding the NATS statement and pointing out that the main proposition of the NATS statement was that there should be no "arbitrary lifting or pushing up on the clavicle and shoulders beyond the level established by good posture."[42]

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[38]Fields, Training the Singing Voice, p. 82.

[39]"Training the Vocal Instrument," p. 1.

[40]Edward Molitore, "This Air We Sing With," The Bulletin, III (July, 1947), p. 5.

[41]Ibid.

[42]Letter of John C. Wilcox in response to a previous article by Edward Molitore appearing in "Our Readers Write," The Bulletin, IV (October, 1947), p. 5.

The general consensus expressed by contributors to The Bulletin about the disagreement as to whether there was an "upward lift" to the chest in the act of inspiration favored the interpretation expressed by Wilcox. Alberti agrees as she points out that "Good posture is essential in breathing. Man was made to stand straight, his head erect, his shoulders well back and his chest high."[43] Tolbert MacRae states, "We all agree on the point of correct posture. That is, we all understand that the upper chest must be held high no matter what position the body may be in, the points of the shoulders back, and these points should never be allowed to be a part of control."[44] Emi de Bidoli says: "A high position of the chest and a straight spine furnish the support."[45] Sonia Sharnova maintains: "The premise from here is that anyone wishing to become a singer must know how to stand erect. Chest is high, shoulders relaxed and down, chin and abdomen in."[46]

Some of the authors made a distinction between a high chest and a natural elevation of the chest created by correct posture. A typical observation about this point was made by York, condemning the practice of "raising the chest as high as it will ever go, which seems of doubtful

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[43]Alberti, "Facts concerning the Art."

[44]Tolbert MacRae, "Breathing and its Effect on Singing," The Bulletin, IV (March, 1948), p. 2.

[45]Emi de Bidoli, "Old Methods of Voice Teaching Versus New Ones," The Bulletin, III (March, 1947), p. 3.

[46]Sonia Sharnova, "Breath Control," The Bulletin, VI (November, 1949), p. 6.

wisdom for human beings, though it is natural for Pouter pigeons."[47] Hermanus Baer[48] and George Newton[49] maintained that the chest should be "moderately high" without any discomfort or unnaturalness. A very popular direct method of achieving the "moderately or comfortably high" chest was given by one of the members of the Committee on Vocal Education in answer to a question addressed to "Quiz Cove":

> Stretch arms upward as far as possible, with heels on the ground and eyes level throughout. The entire rib cage will thus be raised. Next, before dropping the arms note the newly established elevated position of the lowest ribs. Maintain this raised rib cage while the arms are being lowered. Next, roll the head and shoulders slowly, to eliminate stiffness in neck or shoulders, but do not allow the chest to drop while doing this. Repeat this exercise often, until a new, permanently raised chest position is achieved.[50]

Bernard Taylor did not mention a high chest but discussed posture and the position of the chest in this way: "The chest and head need to be brought into perfect alignment to produce the best possible coordination, and the teacher must know his anatomy and physiology if he would obtain the most beneficial results."[51] Thus, Taylor was giving "direct instruction" but by using the term "coordination" indicated that the use of both approaches would be most desirable.

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[47]York, "The Use of Imagery."

[48]Hermanus Baer, "Establishing Basic Conditions for Singing Through Body Position," The Bulletin, IV (May, 1948), p. 6. (Hereinafter referred to as "Establishing Basic Conditions.")

[49]George Newton, "The First Singing Lesson," The Bulletin, XIII (February, 1957), p. 20.

[50]"Quiz Cove," The Bulletin, XXIV (December, 1967), p. 39.

[51]Bernard Taylor, "Teaching Objectives," The Bulletin, VIII (October, 1951), p. 19.

Muscular Coordination

Fields did not include concepts about cultivating correct posture by "Muscular Coordination" but a number of contributors to The Bulletin did discuss the subject. "Coordination" is an important term among advocates of both the Indirect and Direct Approaches. Brown emphasized the place of coordination in achieving good posture by describing muscular relationships as follows:

> Since there must be two conditions co-existent in the body at one time, we could well give attention to the framework within which these muscles must be relaxed and, at the same time, the intrinsic muscles must be ready to perform their function. Of course I refer to posture. It goes without saying, really, that if we are to permit nature to establish a proper balance of tensions between the muscles, that these muscles must in the first place be kept in the relationship one to another that was intended by nature.[52]

York, in discussing the "F. M. Alexander Technique in Singing," describes Alexander's views about posture as being a system based upon the ideals of freedom and balance which could be interpreted as coordination. York upholds his position by saying:

> A system of good posture through freedom and balance is a disturbing point of view for many people because of their unfortunate reflex of bracing and tightening when the word posture is mentioned, whereas the opposite of bracing and, at the same time, the opposite of collapse are the necessary conditions.[53]

Baer, speaking about Louis Bachner's book Dynamic Singing, indicates that coordination necessary for good singing is the result of good posture.[54]

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[52]Oren L. Brown, "Principles of Voice Therapy as Applied to Teaching," The Bulletin, IX (May, 1953), p. 16. (Hereinafter referred to as "Principles of Voice.")

[53]Wynn York, "The F. M. Alexander Technique in Singing," The Bulletin, XIII (May, 1957), p. 28.

[54]Baer, "Establishing Basic Conditions."

Taylor said essentially the same thing as Baer in his article called "Teaching Objectives." Kenneth N. Westerman gives a more comprehensive perspective by saying that muscular coordination is necessary to achieve proper posture, respiration, phonation, resonation, and articulation. Westerman states further that poor respiration is caused mainly by poor posture.[55]

Gradually the term "coordination" was expanded in meaning to include a more refined and accurate terminology gleaned from research and professional sources. Teachers of singing began to realize that in speaking of muscular coordination both the will and nerves of the body are involved. For example:

> We use voluntary neuro-muscular movement (by willing, through feeling) to place the pelvic base of the body instrument into "constant correct posture," whether singing, standing, walking; we place the position of the head resting on the spinal column instead of on constrained neck muscles, again, through feeling. Thus we release the involuntary nervous system for free muscular functioning in the areas of: (1) reflex breath action, (2) proper involuntary resistant action of the vocal bands, producing-- (3) free vibrations finding amplification in the resonators of the mouth, pharynx and most importantly in the opened mask resonator of the head.[56]

In the preceding instruction it is important to notice the use of both scientific and empirical terminology in addition to direct and indirect instruction.

Expansion of the meaning of "coordination" also led to the inclusion of "imagery" as a useful tool of the "mechanistic teacher."

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[55]Kenneth N. Westerman, "The Framework for Developing the Coordinated Muscle Actions of Singing," The Bulletin, VI (May, 1950), p. 2.

[56]Allan Rogers Lindquest, "An Axiom for Vocal Pedagogy," The Bulletin, XI (May, 1955), p. 20.

York, in an article entitled, "The Use of Imagery in Posture Training," says that some teachers and writers on voice tend to oversimplify the teaching of posture improvement because many consider posture to be specifically under voluntary control. York admits that the Direct Approach is sometimes necessary to change faulty posture but if the Direct Approach causes undue tensions the Indirect Approach, using imagery to promote ease and spontaneity, can help to achieve the desired result of good posture. York then supports this conclusion with quotes from some of the instructions and admonitions used by disciples of Alexander which are examples of the use of the Direct and Indirect Approaches. Direct instruction involves the manipulation of arms, legs, and body while sitting, standing, and walking while indirect instruction involves the use of imagery to relieve excess tension. A helpful method of checking posture for proper coordination and freedom may be found in the application of this statement: "Posture must be thought of as the opposite of a static state; free movement is the proper test of it."[57]

Muscular Control of Breath

Fields refers to the muscular controls simply by the term "Diaphragmatic Control," which is described as a strong abdominal compression employed to regulate the flow of breath.[58] Since Fields' publication, one of the most important issues concerning this subject has been the controversy over which term should be used to identify the control under discussion. Terms which have been used to describe this control

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[57]York, "The Use of Imagery," p. 27.

[58]Fields, Training the Singing Voice, p. 85.

usually contain one word in common--support. Individual words often connected with the term support are "body," "chest," "costal," "abdominal," and probably the most widely used term--"diaphragmatic support." Some vocal authorities will not accept the term support but prefer to use the word steady in its place. Vennard was quoted by Dwyer as saying: "The diaphragm steadies the tone, but it does not support it."[59] Lee Hardy agrees with Vennard and adds: "What it does is to hold against the muscles of exhalation so that they will act steadily as they lift the breath out."[60]

Many of the advocates of breath control have found that the term "diaphragmatic control" is a misnomer as are other terms such as "low," "stomach," "belly," and "abdominal" controls. Vennard in discussing the three types of breathing (chest, rib, and diaphragmatic or abdominal) states: "The first should be de-emphasized; the most efficient breathing for singing is a combination of the latter two."[61] Richard Miller agreed with Vennard, stating: "Although several opposing methods of handling the breath in singing do exist, diaphragmatic-costal breathing perhaps more accurately described as diaphragmatic-sternocostal, must claim the largest number of adherents."[62] In general those who advocate costal, diaphragmatic, and/or abdominal controls have been in the majority of those expressing views in The Bulletin.

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[59]Dwyer, "Concepts of Breathing," p. 41.

[60]Lee Hardy, "The Physiology of Breathing," The Bulletin, XV (December, 1958), p. 12.

[61]Dwyer, "Concepts of Breathing."

[62]Richard Miller, "Legato in Singing," The Bulletin, XXII (February, 1966), p. 10.

The examination of instruction given by those who favor the methods of the bel canto period, and who consequently have been labeled as members of the Indirect School, discloses that they have used a good deal of direct instruction concerning the support of the breath. Alberti demonstrates this point in these words: "Bel Canto is based upon abdominal breathing. It is the deep breath that fills the lung to capacity, requiring muscular effort in expiration which provides the energy to the breath column."[63] Similarly, Guarino, Lillian Strongin, and Stults, reviewing the methods of Lamperti, quote some of the direct instructions given by Lamperti to achieve the control of the breath. The examination of Lamperti's statement, "The shoulders must be drawn down insensibly," indicates his use of direct instruction in the discussion of inhalation.[64] Strongin comments on Lamperti's ideas as being direct in nature by saying: "The foundation of all vocal study lies in the control of the breath," and indicates a mechanistic approach in Lamperti's reference to the "use of the diaphragm to control the breath as economically as one pleases."[65] Stults, reviewing W. E. Brown's book, adds a similar reference to the Direct Approach: "The diaphragm does not furnish the energy to sing, it only controls its use."[66]

Many teachers who have used the term "diaphragmatic support" have had the concept that the diaphragm is a voluntary muscle under

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[63]Alberti, "Facts concerning the Art."

[64]Guarino, "Present Day Teacher Reviews Lamperti."

[65]Lillian Strongin, "What is Bel Canto?" The Bulletin, XXII (December, 1965), p. 15.

[66]W. A. Stults, "Book Shelf," review of Vocal Wisdom by W. E. Brown, The Bulletin, XIII (February, 1957), p. 25.

conscious control; others have pointed out that the diaphragm is an involuntary muscle and is controlled only through indirect methods. The fact that the controversy existed is evident primarily because of those who insisted that the diaphragm was not a voluntary muscle. A typical statement expressing this view was one by Charles H. Monroe: "The diaphragm is an involuntary muscle, one which cannot control anything but rather is controlled and actuated by the muscles that are connected to it."[67]

Opponents of any kind of direct controls of the diaphragm declare that the conscious compression and hardening of the abdominal muscles in breathing will gradually spread tensions into various parts of the body. Furthermore, it is held that the diaphragm and vocal cords are involuntary muscles; therefore, it is impossible for the singer to control these muscles by thinking about sensations in them. It is also believed that tensing of the diaphragm is accomplished only during inhalation with its relaxation occurring during exhalation. Thus, it is an error to suppose that compression of the diaphragm controls the exhalation of the breath because like any other involuntary muscle the diaphragm performs best without conscious thought.[68] R. B. Rosewall expresses a similar concept, giving a detailed explanation of the abdominal activity during phonation and maintaining that this action is a reflex action and not an initiating one.[69] Brown, joining the opponents

[67]Charles H. Monroe, "Leverage for Singers," The Bulletin, XVII (December, 1960), p. 13.

[68]Dwyer, "Concepts of Breathing."

[69]Ibid., p. 40, Dwyer quoting Richard B. Rosewall's Handbook of Singing (Evanston, Illinois, 1961), pp. 16-18.

of diaphragmatic controls, maintains that the abdominal region should remain free from pressure to perform its normal function of inhalation and exhalation, and in doing so to remove the danger of unnatural tensions.[70] Golde felt that if a singer allowed the diaphragm to create its customary partial vacuum and let the air be drawn in freely, permitting the sides to expand, the diaphragm would operate automatically and the air would be sent out when the sides collapse. Golde includes some of the Direct Approach when he indicates natural breathing should be put on a "cultivated spontaneous" basis.[71]

Favoring a combination of approaches by interpreting the Indirect Approach in terms resembling those of the Direct Approach is McLean. He says that the mind or the will of the individual is the major controlling factor of action. This concept resembles the Indirect Approach by referring to the use of the mind or will but also carries with it the application of the Direct Approach when McLean states that the will of the individual directs any resulting action.[72]

In articles appearing in The Bulletin, advocates of some kind of Direct Approach to general muscular controls usually write in detail about the physiology of the moving muscles and their functions in gaining control of the breath. Molitore, who goes into considerable detail describing the physiological process of breathing, includes the following information about abdominal support:

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[70]Brown, "Principles of Voice."

[71]Golde, "Cultivated Spontaneity."

[72]McLean, "What Have You to Declare?" p. 3.

> The only way it (diaphragm) can be lifted back, is by the abdominal contents (the viscera) being pressed up against the diaphragm. . . . From the above, it can be seen that the only support that the air in the lungs can have from below, is the support which the abdominal walls and the lower ribs can give to the viscera. The viscera then supports the diaphragm, and the latter supports the air in the lungs--gives it pressure, by confining its movements toward an upward direction.[73]

Wilcox's article, upholding the NATS statement which Molitore attacked, agreed with Molitore on his statement concerning the action of the viscera, saying: "That the viscera must move downward to permit descent of the diaphragm, and that room for this displacement of the viscera must be provided by a proportionate expansion of the upper abdominal wall, seems obvious."[74]

Barrett Stout, in a reply to Molitore's article, disagreed with him about his interpretation of the NATS statement and explained his viewpoint. Stout maintained that in breathing for singing, the muscles governing expansion must not relax suddenly but be gradually overpowered by muscles of exhalation, causing an antagonism of muscular force which gives the singer breath control. He then made a statement similar to that of Wilcox concerning the action of the diaphragm and agreed with Molitore about the action of the viscera.[75] MacRae, upholding the process of direct abdominal controls, agrees with Wilcox but explains in detail about the contraction of the diaphragm and the release of the upper abdominal muscles during inhalation; and the release of the

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[73]Molitore, "This Air We Sing With," p. 5.

[74]Wilcox, "Our Readers Write," p. 6.

[75]Barrett Stout, "Our Readers Write," The Bulletin, IV (October, 1947), p. 5.

diaphragm and contraction of the upper abdominal muscles during exhalation.[76] MacRae's conclusion is that "the balance of these two muscles, one against the other, becomes the control of the voice."[77] Adding validity to the Direct Approach is Henry J. Rubin, a laryngologist for the San Francisco Opera Company during its engagement in Los Angeles, admitting that "how" breath support is achieved is controversial but that "current pedagogical thinking favors a predominantly abdominal type of breathing."[78] He also maintained that the majority of vocal authorities approved of a fixed position of the chest and favored a Direct Approach in achieving support by a contraction of the lower abdominal muscles during exhalation.[79]

Just as the "indirect teacher" frequently realized that the process of training individual voices required both the Indirect and Direct Approach, many "mechanistic teachers" also came to the same conclusion. The exchange of dialogue and experience soon convinced many who were advocates of a strictly Direct Approach that some of their directions, if taken too literally and carried to excess, could cause dangerous tensions; consequently, they began to qualify their remarks and in so doing made concessions to "empirical teachers." The "direct teacher," speaking of the muscular support of breath, admitted that too

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[76]MacRae, "Breathing and its Effect on Singing."

[77]Ibid.

[78]Henry J. Rubin, M.D., "Role of the Laryngologist in Management of Disfunctions of the Singing Voice," The Bulletin, XXII (May, 1966), p. 22.

[79]Ibid.

much compression and hardening of the abdominal muscles in singing often causes excessive tension in the vocal apparatus.

A number of teachers of singing confirm the preceding statements in their writings. Taylor maintains that "there should be no pulling in of these (abdominal) muscles, nor pushing out, but there should be a feeling of resistance, the same sensation that is felt while grunting, humming, etc."[80] Newton says that abdominal support should be coupled with freedom in the throat, and Wilson maintains: "To make students over-conscious of breath hampers free coordinated action in singing."[81] Garlinghouse warns that "harmful tensions can result from too conscious an effort to effect this inward and upward pull" of the abdominal muscles.[82] Monroe, after giving direct instruction as to how to take a breath while controlling the muscles used in support of the breath, adds the caution: "These muscles do not become so tense that they become rigid, or so tense that they cannot easily be released."[83]

The "direct teacher" maintained that the diaphragm was a voluntary muscle but was not capable of controlling the breath by itself. Instead, he would say that breath support is achieved by a coordination of all the muscles in the body, especially those of the costal, diaphragmatic, or abdominal area. The teacher of the Direct Approach also

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[80]Dwyer, "Concepts of Breathing."

[81]Ibid.

[82]Garlinghouse, "Rhythm and Relaxation in Breathing," p. 2.

[83]Monroe, "Leverage for Singers."

learned that empirical words, phrases, and imagery were often useful techniques to be used with direct and scientific instructions causing a partial reconciliation between the "indirect" and "direct" teachers.

Summary and Interpretation of Findings

It is significant that as the present study was begun there were enough contributors to The Bulletin with views on the various subtopics under the heading of the "psychological" or Indirect Approach that Fields' outline could be followed without alteration. While the truth of the statement "Singing Develops Breathing" is as obvious as the validity of the idea that "Correct Phrasing," "Synchronization with the Music," and "Expressional Intent Regulates Breathing," one of the most important prerequisites of good breath control is correct posture. Evidence seems to indicate that it is good practice to begin vocal education with postural instruction; however, most cautious teachers do not bring attention to a fault without first indicating what is correct about the student's posture. The direct method of gaining postural controls is one of the most popular methods of achieving results quickly, but some authorities believe that it would be better to use an Indirect Approach if possible. However, it is often necessary to change faulty posture with direct instruction. If the Direct Approach causes undue tension, the Indirect Approach, using imagery to promote ease and freedom, is helpful in achieving a proper balance.

The first major indication that an amalgamation of approaches was developing came as a result of the re-evaluation and re-interpretation of vocal concepts passed down to us from the "Old Masters" by those who

were considered as members of the "Indirect School." This re-evaluation and re-defining of old concepts was done in the light of the expanding knowledge of science and physiology, indicating that the advocates of the Indirect Approach were accepting the idea that science could be used to an advantage. There were a few who continued to interpret "natural breathing" as a totally spontaneous activity without any attempt at voluntary controls. As an ideal this approach appeared sound but was not generally accepted by those who had students with problems involving breath control.

A second important achievement toward an amalgamation of the Indirect and Direct Approaches was the clarification of terminology and meaning. This is particularly true concerning the technique of diaphragmatic support. It has been generally agreed that the diaphragm is a voluntary muscle but can be controlled indirectly through other muscles. Also, instead of relegating the total responsibility of breath support to the costal or abdominal muscles, more efficiency is acquired if the singer relies upon the coordinated effort of all the body muscles. Both sides, the "indirect teacher" and "direct teacher," tended to agree that muscular coordination coupled with freedom was necessary to achieve the proper action of the muscles responsible for breath support in singing. Thus, the term "coordination" served as an important link in a trend toward a partial reconciliation between the approaches.

After a careful check of those who were quoted as favoring a particular approach, it was found that many of the same people were used as reference sources for the opposing approach. The "empirical teachers" did not teach every technique by indirect means but would use direct

techniques in areas where they were needed. Similarly, teachers of the Direct Approach realized that the use of direct techniques to achieve proper breath control did not necessarily indicate that the student would have enthusiasm or freedom, and when lacking these attributes they could be achieved by indirect means. Therefore, the methodology, whether it be indirect or direct, depended upon the technique taught, the individual student's need, and his response to a particular type of instruction.

CHAPTER IV

PHONATION

Phonation in general means the production of sound by vibration from a vibrator.[1] For the purposes of this study phonation refers to sound produced by the vocal cords. In singing the process of phonation requires control of intensity, pitch, and duration of sound for the purpose of artistic expression. Although the techniques of controlling phonation for the purposes of singing have varied, these variations lessened as teachers of singing realized that various blends of Indirect and Direct Approaches produce more effective results.

Total Coordination

Fields discussed "Total Coordination" as the first topic concerning the methods of controlling phonation because he believed that this process was so integrated with the other bodily functions that no part of the study could be considered independently.[2] Fields recommends the use of the Indirect Approach which embodies the three objectives of mental ease, tonal imagery, and motivation. Thus, his conclusion

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[1] Gove, Webster's Dictionary.

[2] Fields, Training the Singing Voice, p. 101.

admonishes against the Direct Approach which uses "attention-arresting admonitions" because they disturb spontaneous vocal coordinations.[3]

There were twenty-one opinions expressed in The Bulletin on the subject of total coordination, the greatest number of views devoted to any one aspect of phonation. Some, like Alexander and Mowe, maintained that the masters of the past used either general or natural coordination as a basis of vocal training. Others interpreted the term "coordination" and redefined it in relation to physical or mental concepts. More importantly, there were some who used the term in a way which could be accepted by both "indirect" and "direct" teachers.

Leonard Treash agreed with Fields' definition of total coordination, saying that successful modification of vowel sounds is "not merely [dependent] upon one set of muscles but upon a coordination of many sets"; but he indicated that he preferred a more direct approach in achieving coordination than Fields.[4] Frederick Husler was another who advocated a Direct Approach in achieving muscular coordination. Although Husler said coordination could be achieved by getting the right balance of muscular involvement with the vocal processes, he also believed it was the responsibility of the teacher to "wake up" any weak muscles. Husler also made a concession toward the Indirect Approach by warning against "forcing" muscles to respond to movement.[5] MacRae, agreeing with

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[3]Ibid., p. 128.

[4]Leonard Treash, "The Importance of Vowel Sounds," The Bulletin, IV (December, 1947), p. 6.

[5]Patricia Mahon, "The British Summer School of Music," The Bulletin, XVII (October, 1960), p. 25.

Shakespeare, also advocated a Direct Approach in acquiring a balance of opposing muscles which "produces every gradation of force with grace and apparent ease."[6] However, he maintained that a balance of effort should be concealed from the audience and eventually become an unconscious act with the singer.[7] Gerry, leaning in the direction of the Direct Approach, nevertheless maintained that a beautiful tone must first be conceived mentally and then the physiological reaction must be adequate or the resulting tone will be disappointing.[8] Lester is another who, after instructions of direct nature such as open the mouth, groove the tongue, raise the palate, relax the constrictors, or open the throat, explains that "the key to the coordination of all such mechanical actions" is through the use of the Indirect Approach, which relates these techniques by feeling.[9]

Contributors to The Bulletin who advocated the importance of the Indirect Approach placed a new emphasis upon the "human will" in accomplishing total coordination. There were some like Foote who interpreted the use of the "will" much like the masters of the past, de-emphasizing the use of the human will in causing direct movements of the oral area, but he concluded that proper adjustments were made as a result of proper mental conditions and the student should "let the voice

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[6]MacRae, "Breathing and its Effect on Singing," citing Shakespeare, The Art of Singing (Boston: Ditson Co., 1898).

[7]Ibid.

[8]Arthur Gerry, "The Importance of Technique," The Bulletin, V (October, 1948), p. 6.

[9]John Lester, "The Key to Coordination," The Bulletin, VIII (December, 1951), p. 4.

work by itself."[10] Foote elaborated by saying that after a student has established good posture, learned how to take a deep breath, and become able to imagine a beautiful sound, the teacher's job is to get the student's mind off of how to sing and get himself out of the way.[11]

Bernhardt Bronson believed that the physiological basis of singing was based upon the voluntary laryngeal activity bound up in the ear-vocal reflex. He indicated that "through the agency of this circular mechanism, we learn to modify, control, and coordinate the total muscular activity of the vocal-organ in speech and song."[12] Bronson then disagreed with Foote by implying that only through the exercise of the human will could correct singing be accomplished. Taylor agreed with Bronson when he said: "Develop a complete coordination of the actuator, vibrator, and resonator . . . by bringing the entire muscular system of the body under control of the will."[13] Others such as Alexander leaned toward a reconciliation of ideas concerning the "will" in the field of psychology and said that "ideally, a singer's objective would consist of the achievement of a satisfactory control over his own mechanism," responding to his will but also aware that singing is never entirely under conscious controls.[14]

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[10]Foote, "New Horizons," p. 23.

[11]Ibid.

[12]Bernhardt Bronson, "Realistic Psychology," The Bulletin, V (February, 1949), p. 2.

[13]Taylor, "Teaching Objectives," p. 6.

[14]York, "The F. M. Alexander Technique in Singing," p. 28.

Anticipation Controls Phonation

Fields said the concept "Anticipation Controls Phonation" was at that time widely accepted by teachers of singing. The concept is interpreted to mean that if the tone is heard in the mind, the mental processes will cause the vocal mechanism to respond accordingly before the tone is produced.[15] Shortly after Fields' study a statement from the NATS pronouncement "Training the Vocal Instrument" was in agreement, saying that the correct vowel concept "should be prepared before and held during inhalation," which will "automatically establish the desired throat position for tone if there is no antagonistic muscle resistance."[16] Hadley Crawford, defending this statement, says that the act preparatory to phonation is the process of alerting the muscles which are involved. This act of "alerting" would obviously encompass the use of the "will," but Crawford insists that the acts of preparation are combined into reflex actions which are not controllable after the initial impulse of the "will" has been exerted. Therefore, it is very important for the singer to have the right mental concept of correct muscular coordination to achieve perfection in the skill of singing.[17] Discussing the last part of the NATS statement concerning the possibility of antagonistic muscle resistance, Crawford warns that if too much pressure is exerted in the act of phonation, the muscles are alerted to "man their battle stations," creating too much tension.[18]

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[15]Fields, Training the Singing Voice, p. 112.

[16]"Training the Vocal Instrument," cited by Hadley Crawford, "Thoughts on Muscular Coordination," The Bulletin, VIII (October, 1951), p. 14.

[17]Ibid., p. 23. [18]Ibid.

An indirect term used to combat tension caused by too much muscular interference is "relaxation." Lester, discussing the term "relaxation," states that no action can occur as a result of relaxation but movement is caused by muscular tension. Therefore, it is obvious that when teachers use the word "relaxation," they do not mean complete muscular relaxation; rather, the desired response is achieved by the "smoothest coordination of the muscles involved."[19] Brown agrees with Lester, saying that the only time a person is absolutely relaxed is when he is dead and what is actually meant by the phrase is a removal of all unnecessary tensions.[20]

The techniques used to remove tensions vary. Psychologists teach that the cure of a bad habit lies in an appeal to its opposite, and once a "strongly contradictory state of mind is induced there is a powerful inclination to the performance of movement in the opposite direction."[21] Others who advocate the empirical approach indicate that tension can be lessened by taking the mind off the subject and transferring attention to the realm of expression. The opposite approach advocates control by giving attention to the muscles under tension and mentally deciding to relax them. Some, like McLean[22] and Arthur P. Coladarci,[23] realized that devices and techniques from both schools of

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[19]Lester, "The Key to Coordination."

[20]Brown, "Principles of Voice," p. 16.

[21]Cameron McLean, "Causes for Confusion in the Teaching of Singing," The Bulletin, VII (June, 1951), p. 15.

[22]Ibid.

[23]A. P. Coladarci, "The Psychology of Personality and the Teacher of Voice," The Bulletin, VII (March, 1951), p. 8.

thought were useful in eliminating excessive tensions in phonation. McLean recognized that too much pressure caused by excessive localized effort undermines natural coordination while inducing vocal muscular rigidity.[24] He favors the term "psycho-physical operation" to express the process by which natural coordination could be accomplished. McLean emphasized this point by saying that "consumate voice production is the result of good tonal timing between mind and movement."[25]

Otis Simmons approves of a combination of approaches, saying that singing is a matter of both motor performance and cognition with the brain controlling the physical act of singing.[26] Explaining his view, Simmons says that the vocalist needs to perceive the kind of tone the teacher is seeking and have a model to strengthen his memory traces. Consequently, as the student sings, his brain will be kept informed of the physical conditions of the body, the memory traces will stimulate responses that will bring about physical changes necessary to produce a quality similar to the model heard; and then a period of time must be allowed for the formulation of a concept through carefully spaced intervals of practice. It has been proved the mental rehearsal of a motor act is necessary for an efficient learning process because any consolidation of memory traces takes time.[27] Frederick Holler agreed, saying that no good teacher of singing should be unaware of the importance of

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[24]McLean, "What Have You to Declare?" p. 2.

[25]Ibid.

[26]Otis D. Simmons, "Neurophysiology and Muscular Functions of the Vocal Mechanism: Implications for Singers and Teachers of Singing," The Bulletin, XXII (October, 1965), p. 22.

[27]Ibid., p. 23.

the roles played by the body and mind, the conscious parts of our being, but insisted upon the importance of being aware of the subconscious self, the part that is true spirit or the soul.[28] He says that this "spirit" is pure energy and has the power to lift us to extraordinary levels. However, Holler warns that when the conscious being is at cross purposes with the subconscious being there can only be a clash of will within the being, causing a multitude of conflicts. The teacher is therefore responsible not only for the establishment of correct psychological habits but for the development of the whole being related to the singing act.[29]

Anticipation Controls Pitch

While contributors to The Bulletin were in general agreement with the concept expressed by Fields under the heading of "Anticipation of Tone Controls Phonation and Pitch," there was some disagreement about what causes singers to have faulty pitch problems. The controversy centered on the question of whether faulty pitch was caused by an untrained ear or faulty vocal production.

In response to a question regarding faulty pitch, Fields said: "Pitch is controlled by the ear. . . . By processes which are unconscious, the ear demands the correct adjustment."[30] Conversely, Vennard added that faulty pitch may be caused by physical disturbances but moderated

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[28]G. F. Holler, "Using the Total Being in Singing and Teaching," The Bulletin, XX (February, 1964), p. 4.

[29]Ibid., p. 6.

[30]V. A. Fields, "Quiz Cove," The Bulletin, XVIII (October, 1961), p. 39.

his view by observing that if "the singer's ear is good, the teacher should not give up hope."[31] Another member of the Committee on Vocal Education, answering a question about poor intonation, said: "We sing in the mind, not in the larynx, and no one can sing any better than he can hear."[32] The same person agreed with Vennard and said that poor intonation could be caused by extreme tension and improper physical coordination.

Those who believed that poor intonation resulted from faulty production did not hesitate to state their position. Golde, for instance, disagreed with Fields and Vennard by saying that "off-pitch singing is hardly ever a question of the ear," but indicated that if physiological production of tone were free, pitch would be correct.[33] Diercks made a similar statement in discussing instrumentalists with no vocal training who, directing choral organizations, often assume that flatting is due to careless listening and therefore are unable to deal with the functional causes underlying the pitch deviation. Diercks suggests that the admonition "sing higher" is not the answer because most out-of-tune singing is due to improper production.[34] Brown adheres to the idea that faulty pitch is often the result of poor physiological

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[31]William Vennard, "Pitch Difficulties," The Bulletin, XII (May, 1956), p. 5.

[32]"Quiz Cove," The Bulletin, XXIV (December, 1967), p. 38.

[33]Golde, "Cultivated Spontaneity," p. 18.

[34]Diercks, "The Importance of Knowing the Voice," p. 2.

adjustments without proper freedom of the larynx.[35] York agrees in part by saying that "bad voice production results in bad pitch," but also notes that individual aural endowment or development can cause poor intonation.[36]

Vennard, discussing implications of research by Husson, points out that pitch had been thought of as the product of two factors--adductor tension and breath pressure. The process was thought to be monitored by the ear, but not in a direct manner. Husson has clarified the process of producing pitch as using the sense of hearing and the mind to transmit neural impulses "to the vocal cords at the actual frequency desired."[37] Therefore, the student should "think" the tone first, using the Empirical Approach, and use the Direct Approach to make any corrective physical adjustments to insure total coordination.

Oral Controls

Fields lists fourteen teachers who favored voluntary oral controls and six who opposed controls. A majority of the contributors to The Bulletin also favored voluntary oral controls. A typical description of the position of the mouth by the contributors to The Bulletin is found in the review of William E. Ross' book, Sing High, Sing Low, by Stults, who states that this book is "predicated on the working hypothesis that a square, slightly puckered lip position tends to

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[35]Brown, "Causes of Voice Strain," p. 21.

[36]Wynn York, "Vocal Technique in the Sight-Singing Class," The Bulletin, IX (October, 1952), p. 4.

[37]William Vennard, "Some Implications of the Husson Research," The Bulletin, XIII (February, 1957), p. 5.

establish oral and pharyngeal conditions favoring attainment of maximum tonal freedom."[38] Ross made it clear, however, that the position of the mouth or lips should not be thought of as fixed or rigid, but flexible.[39]

Lingual Position

Under the general heading of "Lingual Position," Fields discusses the categories of "low tongue" and "free tongue." Contributors to The Bulletin were more diversified concerning tongue freedom and position. Even opinions concerning how the old masters approached matters of the tongue differed. Alberti[40] maintained that the old masters did not teach a voluntary manipulation of the tongue, whereas de Bidoli[41] said, "holding the tongue flat and making a groove was an absolute rule in olden days." The same difference of opinion existed in 1948 when Paul MacCollin[42] said: "The last thing in the world to suggest to a pupil is conscious control of the double action of the tongue" while Herbert Gould[43] said: "I would rather that a student become tongue conscious than to permit the bad effects resulting from failure to rule the tongue."

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[38]Walter A. Stults, "Bookshelf," The Bulletin, XX (May, 1964), p. 27.

[39]Ibid., p. 28.

[40]Alberti, "Facts concerning the Art," p. 4.

[41]De Bidoli, "Old Methods of Voice Teaching versus New Ones," p. 3.

[42]Paul MacCollin, "Tongue Action," The Bulletin, IV (March, 1948), p. 3.

[43]Herbert Gould, "Phonation," The Bulletin, V (May, 1949), p. 6.

Several contributors to The Bulletin wrote in detail about the tongue and its movement relative to the formation of vowels and the articulation of consonants. Others discussed the correct movement of the tongue in the act of phonation which would insure freedom and at the same time avoid interference. Bronson observed that the tongue is the chief muscle of speech and maintained that "its normal behavior was antagonistic to the production of prolonged, definitely pitched vowels."[44] Bronson's method for achieving proper control of the tongue was through the use of "coordination," which has been described as an aid in reconciling Indirect and Direct Approaches. He said that until tongue behavior is brought into coordination with tonal concepts, it will continue to interfere and create muscular tensions.[45] Although the importance of the tongue is obvious in communication, Robert M. Taylor says that even if the tongue were removed the individual could phonate certain vowels by creating "the proper combination of cavity volumes and conductivity factors of the apertures in the mouth and head so that the required vocal formants were created."[46]

Palatal Controls

According to Fletcher, Haskins, and Bosma, "palatopharyngeal apposition ordinarily occurs during phonation of each vowel and voiced consonants, with the exception of the nasal consonants (m), (n), (ng).

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[44]Bronson, "Realistic Psychology."

[45]Ibid.

[46]Robert M. Taylor, Acoustics for the Singer, Graduate Division of Kansas State Teachers College Publication: Emporia State Research Studies, IV, No. 4 (Emporia, Kansas: Kansas State College Press, 1958), p. 30.

If this approximation is not achieved, an excessive proportion of the phonatory air stream may pass through the nasal cavities . . . and produce unusual patterns of resonance classified as hypernasal voice."[47] Excessive nasality will occur even if the space between the palate and pharyngeal wall exceeds a few millimeters.[48]

Regarding "Palatal Controls" Fields had only six contributors without a clear-cut majority concerning any one aspect of its control. Contributors to The Bulletin also avoided the subject, with only two making a direct reference to palatal controls. McLean states that the soft palate ascends simultaneously as the larynx moves down.[49] Lindquest indicated the use of the Direct Approach when he said singers should exercise, flex, and strengthen soft palate constrictor action through the use of the [hŋ][50] sound of the hum. He also indicated the use of the Indirect Approach by saying: "There is no instruction to lift or to manipulate locally the soft palate, but just to work for the feeling, for the shimmer of post-nasal resonance."[51] Taylor said that it is understandable why the teachers of the past often relied upon tangible and mechanical devices such as raising the palate and lowering the tongue to secure the desired tone because they were not aware of the acoustical factors related to sound and singing.[52]

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[47]Samuel G. Fletcher, Richard C. Haskins, and James F. Bosma, "A Movable Bulb Appliance to Assist in Palatopharyngeal Closure," Journal of Speech and Hearing Disorders, XXV (August, 1960), p. 249.

[48]Ibid. [49]McLean, "What Have You to Declare?" p. 4.

[50]International Phonetic Alphabet symbols used in this study are listed in the Appendix.

[51]Allan Rogers Lindquest, "Security in Singing," The Bulletin, V (March, 1949), p. 3.

[52]Taylor, Acoustics for the Singer, p. 7.

Specialists today say that hypernasality may be "controlled by the soft palate and the adjacent portions of the pharynx. Analogous to the tongue, the soft palate has both intrinsic and extrinsic musculature, [and] is mobile in an anatomical cavity."[53] McDonald and Baker maintain that "exercises designed to diminish the size of the velopharyngeal lumen or to open wider the oral cavity will modify the characteristics of the speaker's resonators."[54] These exercises range from lifting the soft palate by means of the yawn to the use of certain vowels which tend to achieve maximum orality.[55]

Open Throat

There appeared to be little disagreement concerning the importance of a singer's having an "open throat" either in Fields' book or The Bulletin. The majority of teachers of singing expressing views in The Bulletin agreed with McLean's statement that the main cavities of the voice are the throat and mouth. The size and shape of the throat are variable by movements of the tongue and other muscles. The throat itself is part of the pharyngeal cavity, which is the main resonating chamber.[56]

Research on vocal efficiency made by William H. Perkins in 1958 confirms the concept that the "increased vertical and area measurements

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[53]Fletcher, "A Movable Bulb Appliance to Assist in Palatopharyngeal Closure," p. 251.

[54]Ester L. Herbert, ed., "Clinical Forum," Journal of Speech and Hearing Disorders, XXV (August, 1960), p. 300, citing McDonald and Baker's article in XVI (February, 1951), pp. 9-20.

[55]Ibid. [56]McLean, "What Have You to Declare?" p. 3.

of the pharynx generally accompanies vocal efficiency."[57] The area of disagreement lies in the method used to achieve an open throat and the remedy for a "throaty sound." Probably the most common term used to achieve an open throat is relaxation. In an article reprinted in The Bulletin, Dudley Buck takes issue with the use of the term "relaxation," saying that "the moment the throat is relaxed it becomes flabby and more or less closed" but then suggests that the singer acquire a "firm throat that remains open so that the tone can flow through it without interference."[58] A member of the Committee on Vocal Education, answering a question, agreed with Buck's statement about the common misuse of the term "relaxation." He preferred the term "noninterference" as a more desirable way to express the condition we seek in the laryngeal area and indicated that the student might even feel an inner "tightness" in phonation which if properly guided would be helpful in gaining the correct firmness of the throat.[59]

A popular approach for preparing the throat for phonation is the method of using inhalation to open the throat. This method is generally considered an Indirect Approach to the problem. Some advocate a conscious control over the throat after inhalation while Harvey Ringel and others say that "there can be no conscious control even in the retention of this desirable condition."[60] Another indirect method often

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[57]W. H. Perkins, "Research on Vocal Efficiency," The Bulletin, XV (December, 1958), p. 7.

[58]Dudley Buck, "Some thoughts for the Singer--An attempt to clarify erroneous terminology," The Bulletin, VIII (May, 1952), p. 14. Originally published in Tempo, March, 1934.

[59]"Quiz Cove," The Bulletin, XIX (May, 1963), p. 28.

[60]Harvey Ringel, "Vowel Vanish--A Vocal Deterrent," The Bulletin, IV (October, 1947), p. 3.

used to achieve an open throat is the act of swallowing. This technique was used by the old masters and passed on to us by many such as Shakespeare who said: "The quiescent condition of the throat when drinking something delectable from a glass is the sensation which should accompany every note we sing."[61] While the act of swallowing is not in itself of value, its consequences are vital, i.e., the reflexive lowering of the larynx and opening of the throat for inhalation.[62] The instruction itself is empirical in nature, but direct attention is necessary to make this technique useful inasmuch as conscious and deliberate retention of the throat position gained as a consequence of swallowing is necessary to maintain openness for any length of time.

The use of the "yawn" as a device to produce an open throat was commonly used in the past and continues to be used today. "Yawning" has been defined as an involuntary act and its use as a device to achieve an open throat should be considered as an Indirect Approach. One would not expect to sing during the act of yawning but its value lies in use of the preparatory sensations of the yawn. To achieve the preparatory sensations of a yawn, the Direct Approach is needed to suppress the full yawn and to take advantage of the preparation for the yawn. The yawn is initiated subconsciously so that the mere mentioning of the word may cause its execution. Also, during the initial stages of learning to sing, the lowering of the larynx, raising of the palate, and the full inhalation of cool air is conducive to completing the yawn; therefore,

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[61]McLean, "What Have You to Declare?"

[62]"Quiz Cove," The Bulletin, XXIV (December, 1967), p. 40.

it is necessary to suppress by direct means this tendency to complete the yawn and keep the throat open to the correct degree necessary for an agreeable tone. Alice G. Duschak and others have used the descriptive terms "simulating" or "pretending" to yawn which can only be considered indirect in nature.[63] Thus, it is obvious that both the indirect and direct techniques are used in combination to achieve an open throat by the use of a simulated yawn.

Laryngeal Controls

A significant change of concept has occurred since Fields' study concerning whether the larynx should move or not during the act of phonation. Fields states that the eighteen statements expressing opinions on the question of whether the larynx should move or not are evenly divided. However, the twenty contributors to The Bulletin were unanimously in agreement that there was some movement of the larynx during phonation! It is believed that the increasingly broad distribution of scientific knowledge about physiology has been a contributing factor in creating unanimity concerning laryngeal movement. Janwillem van den Berg's experiments, interpreted by Vennard, sums up one such project in these words:

> There must be a balance between the supralaryngeal tension (of the swallowing muscles) and the infralaryngeals. This may be assumed to exist with the "comfortably low" position [of the larynx]. Only when the larynx is free from both excessive supralaryngeal and excessive infralaryngeal tensions can the glottis be expected to generate the tone which a trained ear will recognize as having freedom.[64]

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[63]Alice Gerstl Duschak, "Reflections and Aphorisms on Singing," The Bulletin, XVI (December, 1959), p. 26.

[64]Janwillem van den Berg and William Vennard, "Toward an Objective Vocabulary for Voice Pedagogy," The Bulletin, XV (February, 1959), p. 13. (Hereinafter referred to as "Toward an Objective Vocabulary.")

Earlier research reported by Westerman indicated that the larynx would rise to produce high pitches and lower to produce low pitches.[65] In 1956, Alexander Kisselburg expressed the idea that a lowered larynx produces a dramatic tone and a raised larynx produces a lyric tone. He also pointed out that most laryngeal complications were caused by the raised, constricted larynx.[66] In 1958 Perkins, who published research findings which further reinforced the low larynx concept, stated that one of the characteristics of vocal efficiency was a lower position of the larynx.[67] Eugene Conley made a similar study in 1967 and stated that his studies and those of Perkins, Sawyer, Harrison, and Ruth "substantiate the theory that vocal efficiency is associated with a low position of the larynx (below the at-rest position during phonation)."[68]

Since there was agreement that the larynx should be low for efficient and desirable singing, the main point discussed by teachers of singing was the best method of achieving this "low position" without undue tension. The two most popular ways used to achieve the low position of the larynx were indirect in nature. The first method was the use of the reflex action of inhalation which causes the larynx to go down automatically. One of the problems associated with this method is caused by the reflex action of the larynx which returns to its original

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[65]Kenneth Westerman, "Resonation," The Bulletin, V (May, 1949), p. 2.

[66]Alexander Kisselburg, "Corrective Vocal Techniques for Certain Speech Difficulties," The Bulletin, XII (February, 1956), p. 11.

[67]Perkins, "Research on Vocal Efficiency," p. 6.

[68]Eugene Conley, "An X-Ray Study of the Larynx Position of Good and Poor Speakers," The Bulletin, XXIV (October, 1967), p. 4.

position as soon as inhalation ceases. Some teachers use a direct method to retain the low position of the larynx achieved by inhalation. This Direct Approach sometimes causes undue tension or a bracing effect on the larynx. A typical warning against these dangers was given by Gould when he said, "The maintenance of the larynx level by this means is not to be attempted without wise and understanding guidance; otherwise it may result in hardness of the throat and distortion of the entire sound-producing instrument."[69]

The second most popular method to achieve the low position of the larynx is through the reflex action of the "yawn." It is obvious that if the yawn is used to create more room in the throat, the lowering of the larynx is one of the ways this room is created. It is also obvious that the yawn incorporates the act of inhalation which causes more room in the throat. The method of achieving the right opening without completing the full yawn has been discussed previously by using the "simulation of a yawn."

Other methods suggested to achieve low laryngeal position during phonation are the "swallowing act" and "correct posture." It is unnecessary to restate how the "swallowing act" achieves a lower larynx, but Baer gives an additional method of achieving a low larynx when he writes that the larynx will assume a comfortably low position automatically when the body is in the correct position for singing. This posture may be experienced by raising the folded arms until the elbows are slightly higher than the shoulders and then drawing the chin back (not down) as far as possible without discomfort.[70]

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[69]Gould, "Phonation."

[70]Baer, "Establishing Basic Conditions."

According to Ralph Appelman the proper position of the larynx is a primary factor in establishing a sound vocal technique. The singer's problem is to select the laryngeal position which is right for him. Even though there are individual differences in voices, there are some general guide lines which are helpful to the teacher. For instance, if the larynx is depressed too far, the tone will be a dark, highly damped sound, and "if the larynx is held too high, the uttered sound becomes blatant and colorless."[71] Appelman also recommends the use of the "sensation" of the first stage of the yawn to find this correct laryngeal position for the individual singer.[72]

Vocal Attack

A great deal of scientific knowledge about the nature of the "vocal attack" has been gained since Fields' work of 1947. Most of the information available at that date was either empirical in nature or, in many cases, misunderstood. Manuel Garcia was the main early investigator to contribute information about the process of beginning a vocal sound, and many of his findings have been misunderstood. We are indebted to Vennard for the clarification of many of Garcia's pronouncements, especially the misinterpretation of what Garcia meant by the term coup de glotte. Vennard said that Garcia did not mean "glottal plosive," and himself tried to avoid this misunderstanding by saying that it was necessary to guard against confusing the stroke of the glottis with the cough.

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[71]D. Ralph Appelman, The Science of Vocal Pedagogy (Bloomington, Indiana: Indiana University Press, 1967), p. 84.

[72]Ibid.

This type of attack is far from being the commonly held conception of a shock but is more like a gentle "popping" exercise for the muscles of the vocal cords.[73]

It is significant, however, that Vennard was not content with just the information Garcia and others left, but carried on personal investigations and has continued to interpret available research findings of others such as Van den Berg. Vennard reported that the commonly called "stroke of the glottis" involved the closure of the glottis and the creation of breath pressure below the glottis which overpowers the tension in the vocal cords and starts the tone. In describing the "glottal plosive," Vennard says that the glottis is closed tightly first, with the breath pressure following the closure. To avoid this procedure he advocates the use of the "imaginary [h] " which is conducive to creating a perfect synchonization of closing the valve and applying breath pressure.[74] It was natural for readers of The Bulletin to have questions regarding methods of achieving this "perfect synchronization" of closing the valve and applying pressure. One answer published in The Bulletin, which is both direct and indirect in nature, suggested that if the establishment of coordination between the breath and laryngeal activity was not naturally free, this should be the subject for early exercises to heighten the breathing reflex and to encourage a spontaneous attack. The author said it was impossible to practice spontaneity but some of the circumstances surrounding a spontaneous

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[73]Vennard, Singing, the Mechanism and the Technic, p. 48.

[74]Van den Berg, "Toward an Objective Vocabulary," pp. 14-15.

attack could be produced deliberately, as is readily perceived in the advocacy of a combination of approaches.[75]

The direct technique of "panting" was also suggested as a method to make the singer aware of the posture of the throat. The student is instructed to phonate a tone of bright timbre on each outgoing breath preceding an aspirate consonant. The quick inhalation after each attack serves both as a direct and indirect method to avoid strain that is often characteristic of staccato exercises. The conscious use of aspirates in vocal attack is a direct method to gain control over vocal coordination. Great care should be exercised to insure that the aspiration precedes phonation, and pitch should be related to the increase and decrease of the momentary pressure against the breath at the instant of phonation.[76]

Vennard, conceding to the warnings made by those who advocate the Indirect Approach, adds that attacks which are forced produce strain because phonation tends to follow the pattern by which it is started.[77] Cox, giving another cause for faulty attacks, says that "most poor attacks are caused by pausing between inhalation and phonation."[78] The majority of views expressed in The Bulletin agreed with Brown's conclusion that coordination was necessary to achieve correct vocal attacks. Brown said that a well-balanced tone calls for an equalization of breath pressure and

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[75]"Quiz Cove," The Bulletin, XXIII (May, 1967), p. 39.

[76]Ibid.

[77]Vennard, Singing, the Mechanism and the Technic.

[78]Cox, "A Matter of Semantics," p. 16.

laryngeal adjustment which can be controlled directly.[79] In "Quiz Cove," readers were advised that the onset of an "attack is always soft, not hard. The balanced condition of the body musculature determines the nature of the attack." [80]

Summary and Interpretation of Findings

The opinions expressed in Fields' book of 1947 show the importance of "total coordination" in the field of "phonation" but defined it primarily as being an Indirect Approach, warning against any direct teaching as being responsible for disturbances of a spontaneous act. The information gleaned from writings since Fields' book have shown a redefining of the term "coordination" so as to be acceptable to adherents of both approaches.

At first those who were advocates of the Direct Approach used the term "coordination" with the meaning that if muscles were weak, these muscles should be awakened and used deliberately in order to strengthen them to achieve a balance between the opposing muscles. Early advocates of the Indirect Approach thought of the "will" of the individual as causing proper adjustments by unconscious means. Later views expanded the concept of the human will as using thought processes as a stimulus to automatically establish the desired throat position by manipulating the muscles involved. The act of "manipulation" would encompass the use of the "will," which becomes a reflex action, but the act remains under the conscious or direct control in the initial stages. It is readily perceived that both indirect and direct methods are used.

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[79]Brown, "Causes of Voice Strain."

[80]"Quiz Cove," The Bulletin, XXVI (March, 1970), p. 40.

A combination of approaches is useful in correcting a problem of excessive tension caused by exertion of too much pressure in any phase of phonation. The Direct Approach is involved in any exertion, and the Indirect Approach, using the stimulus of "relaxation" or taking the mind off the process, relieves excessive exertion. The result is a type of cooperation best described by the term "psycho-physiological operation." The teacher, then, is responsible not only for the establishment of correct psychological habits but for the development of the whole being related to the singing act. It was not until the "indirect" and "direct" teacher began to understand more about bodily function that a reconciliation began to take place. When it was understood that the "will" of the individual was necessary in achieving any muscular change and a forceful manipulation of muscles was accompanied by excessive tension, both sides began to look at the full implications of the word "coordination" and realized that the approaches were interdependent.

Although there has been no change concerning the acceptance of the concept that "Anticipation Controls Pitch," additional information about this subject has become available during the last few years. This information included the realization that faulty pitch is often the result of poor physiological adjustments without proper freedom of the larynx. The student who tends to sing flat in pitch often is not expending enough energy and the student who sings sharp is conversely trying too hard, causing tension which results in a higher pitch than he is trying to produce. Another finding related to pitch, contributed as a result of research, indicates that pitch is the product of adductor tension, breath pressure, and the mind which is directed by the sense of

hearing. The process of producing a desired pitch is explained as using the mind to "think" the pitch first, by the Indirect Approach, and employing the Direct Approach to make any corrective adjustments necessary.

Concerning the subject of "Oral Controls," the majority of opinions found in Fields' book favored voluntary controls, as has been true of those expressing views in The Bulletin since that date. The use of the Indirect and Direct Approaches were found to be necessary in achieving a "low free" tongue with the term "coordination" again used as a major reconciling factor. The subject of "Palatal Controls" drew little attention in Fields' survey but since then specialists have learned that a closure of the nasal cavity from the mouth is necessary to achieve a quality without nasality. Hypernasality may be controlled directly or indirectly by the movement of the soft palate and the adjacent portions of the pharynx. Nasal quality is reduced by diminishing the size of the velopharyngeal lumen and opening the mouth to a greater extent.

The "Open Throat Concept" found almost perfect agreement among those expressing views, but disagreement was found in the method of achieving this desirable state. An important finding concerning this topic was in the clarification of the term "relaxation," which has been accepted by teachers of both the Indirect and Direct Approach as meaning a state of proper tonus, not meaning the same as the relaxation of death. The method of achieving this proper tonus through simulation of the yawn and other indirect methods has been explained to mean the involvement of both direct and indirect methods.

A significant change of attitude has been found as a result of this study concerning whether or not the larynx should move during phonation. Fields states that there was an even division of opinions concerning this topic in his book, but contributors to The Bulletin were unanimous in their acceptance of the concept that the larynx does move during phonation. It is believed that the broader distribution of scientific knowledge about the anatomy of the larynx to the members of NATS has been the major factor in achieving this agreement. Even though there has been some disagreement about the position of the larynx during phonation, research findings have indicated that a "moderately low" position of the larynx is most conducive to efficiency and artistry. The methods used to achieve this correct position have varied, but the most popular approach has been a combination of approaches. A combination of approaches has also been gradually realized as the best approach in achieving proper coordination in the vocal attack. Much has been learned about the mechanics of phonation, including the starting of tone, but many of the same techniques used by the old masters are still used in acquiring the desired effect with the added knowledge of why these techniques work. The understanding of why techniques work tends to make clear to most teachers the need for a methodology embracing both direct and indirect means.

CHAPTER V

RESONATION

Fields showed that the acoustical properties of a tone were explained predominantly by empirical theories in the vocal texts examined and that the methodologies were obscured by opinion and controversy.[1] Since that time a number of commonly accepted theories and methodologies have been discredited by scientific findings. The description and clarification of acoustical and physiological factors of resonance has also tended to suggest techniques for acquiring the desired results from the resonators. Thus, Fields' outline of "Physiological Factors" shall be followed except where related areas and methods of control can be combined under one heading.

Fields indicated that the accuracy of "resonance" as a term to describe what teachers seek was seriously questioned. He suggested that many teachers have used the term "to cover up deficiencies in scientific accuracy when describing the operation of the vocal organs."[2] The inconsistencies in the use of the term "resonance" before Fields' publication is evident in opinions expressed in his book and other writings. The term is commonly misused as a synonym for general tone quality as well

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[1] Fields, Training the Singing Voice, p. 148.

[2] Ibid., p. 146.

as specific types of quality such as "ring" or "brilliance," "depth," and "warmth" of a tone.[3] Although many continue to use the term indiscriminately, views expressed in The Bulletin have progressively tended to use "resonance" according to its scientific definition.

Many have submitted articles to The Bulletin describing the physical properties of sound and redefining the term "resonance" in ways to clarify and simplify the meaning for the average teacher of singing. It is assumed that the teacher with better understanding of the acoustical and physiological factors of resonance is in a better position to deal with a more effective application of its use. With such a purpose, Westerman explains that sound waves may be reinforced in a cavity and this phenomenon of resonance is a "re-sonance" or the "re-sounding" of a sound wave on itself.[4] The energy needed to produce sound waves is generated by the motor or in the case of a vocalist by the body. The sound is produced by the action of air pressure upon the vocal cords (the vibrator), and the rarefication and compression of air creates vibratory disturbances in the form of sound waves. The rate at which a vibrator oscillates determines the number of compressions and rarefactions per second, referred to as "frequency." Any given frequency has its fundamental with a harmonic series of sounds which are either multiples or submultiples of the fundamental. Most sounds are considered as complex in nature and contain partials and harmonics. When these complex sounds are passed to the resonators of the vocal instrument,

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[3]Vennard, Singing, the Mechanism and the Technic, p. 13.

[4]Westerman, "Resonation."

"the characteristic tendency of the resonator is to amplify or reinforce those tones with which it is compatible and to dampen or eliminate the tones with which it is not compatible."[5] A tone produced in the larynx speaks a fundamental frequency which includes a series of harmonics. The passed harmonics are those which coincide with the natural resonance of the various cavities in the vocal tract. Robert M. Taylor, in describing resonance, says that it is a condition resulting from the coupling of the source of sound to a resonator.[6] Appelman says "resonance occurs when a resonator is in tune with its vibrator."[7] Thus, in singing, resonance may be thought of as the harmony or relationship of frequencies between the vocal cords and the resonating cavities.

Head Resonance

Fields states that opinions were divided about the importance of the head cavities in singing. The "indirect teacher" insisted that all tones must be "resonated" in the mask of the face so he relied upon sensations in various parts of the head much like those advocated by Lilli Lehmann.[8] A few supported Bartholomew's "new" ideas which indicated that even though the singer's attempt to feel "head resonance" often proved to be helpful in obtaining a better tone, "the actual resonating of sound in the head cavities was of very little importance."[9] Fields

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[5]Appelman, The Science of Vocal Pedagogy, p. 117.

[6]Robert M. Taylor, Acoustics for the Singer, p. 24.

[7]Appelman, The Science of Vocal Pedagogy.

[8]Lilli Lehmann, How to Sing, translated by Richard Aldrich and revised by Clara Willenbucher (New York: MacMillan Co., 1902, 1937).

[9]Fields, Training the Singing Voice, p. 135.

indicates that a majority of opinions cited in his book favored the concept that sinus and head cavities above the mouth were of definite value as resonators. However, contributors to The Bulletin tended to deemphasize their importance. A typical statement was made by Vennard, who states: "It is true that these small chambers of air do respond to high frequencies, and sensations in the sinuses may be proof of the presence of desirable overtones in the voice, but scientists today agree that the sinuses do not add anything to the tone."[10] He states further that the theory of registers grew out of the fallacy that the voice is augmented by resonance at different pitches from particular head cavities, giving birth to the idea that tones should be sung out of various parts of the face and skull with others reflecting off the sounding board of the chest.[11]

Another important change in concept has occurred since Fields' publication regarding the subject of "nasal resonance." The majority of the writers in Fields' day believed that "nasal resonance" was essential to a good tone and accepted the nasal cavity as a resonator. This view was popular until scientific investigation shed new light upon the subject. Warren B. Wooldridge, a board member of the NATS Research Committee, reported findings of an experiment made under his supervision concerning the relative importance of the nasal cavities as resonators which proved that the theory of "nasal resonance" was false. He used eight professional singers with their noses occluded with cotton, singing with and

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[10]Vennard, Singing, the Mechanism and the Technic, p. 17.

[11]Ibid.

without the stuffing, and recorded each experiment with a jury of listeners to determine the results. The results showed conclusively that there was no more variation between a normal and occluded tone than appears between any two normal tones. In other words, there was not a part of the vocal tone which could be described as being a result of "nasal resonation."[12]

Vennard agrees with Wooldridge's summary and adds additional information about "nasal resonance" by reporting on the studies of Raoul Husson, Van den Berg, and his own. Based on the findings of Husson, Vennard expresses the view that during singing, the sensations experienced in parts of the face cannot be described as resonance but rather are caused by the absorption and dissipation of vibratory energy in that area. The vibratory sensation excites a reflex action which is "sensed in the brain and becomes part of a circuit back to the larynx by way of the ear. Thus, we discard the idea of acoustical resonance, and accept a kind of neurological or psychological resonance."[13] Husson said that for at least a century it was "believed that the nasal cavity belonged to the pharyngo-buccal vocal spectrum of the nasal formants resulting from nasal resonance."[14] Now it is known that the nasal cavity is not a resonator which adds something, but a filter which removes certain elements of the input mixture. Husson says that the filtering "cuts off

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[12]Warren B. Wooldridge, "Is There Nasal Resonance," The Bulletin, XIII (October, 1956), p. 28.

[13]Vennard, "Some Implications of the Husson Research," p. 5.

[14]Raoul Husson, "The Pharyngo-buccal Cavity and its Phonatory Physiology," The Bulletin, XVI (February, 1960), p. 10.

in general the pharyngo-buccal mixture of the 1200-2000 c/s band with variations according to the vowels emitted and the nasal conformations of different subjects."[15]

Acquiring a Vocal Focus

Fields says that to focus the voice is to direct the attention toward a localized area of the body where a great deal of vibrational or resonance activity is centered.[16] Three terms which are often used to describe the sensation of focus are "placed," "directed," and "projected."

There were several contributors to The Bulletin expressing themselves during the first part of the period covered by this study who would not accept the terms which refer to the act of "focusing" because they did not believe that the tone could be literally "placed" or "focused." Buck states that "as far as placing the voice is concerned, there is nothing to place. It is a condition, not an act."[17] Bernard Taylor maintains that a tone cannot be "focused," "directed," or "placed" because sound does not travel on the breath but "by a series of condensations and rarefactions, or by one molecule impinging on another molecule through the still or unmoving air."[18] Furthermore, Taylor says that the use of a technique which advocates the "focusing" of a tone results in "localized interferences that completely prevent a free-functioning vocal

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[15]Ibid.

[16]Fields, Training the Singing Voice, p. 141.

[17]Buck, "Some Thoughts for the Singer--An Attempt to Clarify Erroneous Terminology."

[18]Bernard Taylor, "Teaching Objectives," p. 19.

mechanism."[19] McLean also maintains that it is impossible to consciously direct a tone. He says that "all tone placers are tone pushers" and that "a tone placer's larynx is at no time normal," causing the early deterioration of the vocal organs.[20] McLean believes that singing should be natural and an unconscious act with the singer achieving a balance between opposing muscles to create equalization between pressure and resistance. This balance provides an opportunity for the production of free vibrations.[21]

Both Taylor and McLean might be classified as advocates of the Indirect Approach by their comments, but a number of teachers who are considered as disciples of the Direct Approach would agree with them in part, saying that excessive tension can result from an overzealous attempt to focus the tone. The "direct teacher" would also agree that the vocal instrument should be a free functioning mechanism and that singing, in the final analysis, should be as nearly as possible a spontaneous and natural act. McLean indicates a mechanistic tendency when he describes the natural act of singing as being a balance between opposing muscles. A member of the Committee on Vocal Education, answering a question sent to "Quiz Cove," was another who, like Buck, Taylor, and McLean, indicated his disdain for the misuse of the term "projection" by saying: "One 'irky' word is projection."[22] He continues by advising

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[19] Ibid.

[20] McLean, "Causes for Confusion in the Teaching of Singing."

[21] Ibid.

[22] "Quiz Cove," The Bulletin, XX (December, 1963), p. 27.

that the "earliest dictums of the Italian masters--drink the voice, yawn the voice, meaning to 'sing in'; disappear when projection enters."[23] Although the term "projection" means to "direct one's voice so as to be heard clearly at a distance," this is a result of efficiency involving the ring to the voice and not to be confused with a literal meaning of directing the voice.[24]

Stults, reviewing W. E. Brown's book, quotes: "Voice-placing, as a term, is a misnomer; voice-finding is much more appropriate."[25] The reason these teachers objected to the use of the terms referring to focus was prompted by scientific investigation which explained how the ring to the voice was achieved and proved that the literal usage of such terms was false. Vennard, reviewing Bartholomew's findings said that "ring has been identified as the presence of strong overtones ranging from 2800 cycles per second to 3200 cps."[26] Vennard says that the ring to the voice is produced in the laryngo-pharyngeal resonator cavity--probably "in the space formed above the vocal lips by the epiglottis and the aryepiglottic folds, or in some other part of the pharynx, and it is energized properly only when the vibrator is functioning properly."[27] Vennard also says that ring is "often attributed to nasal resonance and

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[23]Ibid.

[24]William Morris, ed., The American Heritage Dictionary of the English Language (Boston: American Heritage Publishing Co., Inc., 1969).

[25]Stults, "Book Shelf," February, 1957.

[26]Van den Berg, "Toward an Objective Vocabulary," p. 12.

[27]Vennard, Singing, the Mechanism and the Technic, p. 96.

the formant of this partial (2800-3200 cps) is often called the nasal formant."[28] Husson gives a more detailed account of a so-called "focused" tone:

> We know that the acoustic pressures developed in the buccopharyngeal cavity stimulate the sensitive limits of the mucous membrane, and that the sensory influx thus released, by a reflex arc at the bulbar-reticular level, supply the contraction of the glottic sphincter. This action of sphincteric reenforcement extends the glottal potential toward high harmonics, i.e., it increases the proportion of harmonics that are higher than the cutoff frequency of the cavity (from 2300 to 2500 cycles per second). The voice then takes on a bright or piercing quality.[29]

Vennard said that even though the "mechanistic teacher" attempts to be completely objective in describing the singing act he is forced sooner or later to use subjective methods and must describe how a good tone "feels." Such subjective methods require the use of figures of speech and poetic imagery. He maintains that teachers not only use subjective terms but also use gestures, such as the up-and-over gesture. The use of such pseudo-scientific terms as "focus" and "placement" are dangerous because "they sound more literal than they really are in practice."[30] In order to use such terms, the teacher must instruct the student carefully by making it clear when figures of speech or literal facts are presented. For communication to be effective, a figure of speech should refer to a common experience or sensation which the student may experience.[31]

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[28]Van den Berg, "Toward an Objective Vocabulary," p. 14.

[29]Raoul Husson, "How the Acoustics of a Hall Affect the Singer and Speaker," The Bulletin, XVIII (February, 1962), p. 11. (Hereinafter referred to as "How the Acoustics.")

[30]Vennard, "A Message from the President," February, 1965.

[31]Ibid.

Although a majority of opinions expressed in Fields' book favored the conscious or Direct Approach in achieving ring in the voice, there were a substantial number favoring the Indirect Approach. This same tendency was noted in opinions expressed in early editions of The Bulletin; however, the majority of later opinions favored a combination of approaches to teach students how to achieve a bright or ringing quality. Those who preferred the Indirect Approach used imagery phrases based on sensations such as: sing toward the front of the mouth and keep the tone spinning,[32] place the tone in front of the teeth, sing toward the corner of the room, "direct the tone along the roof of the mouth,"[33] and "lean the tone firmly against the upper mask of the face."[34]

Golde used a mixture of the Indirect and Direct Approaches when he said: "We may have one of two kinds of tone, either a floating tone or a driven tone."[35] "Float" means that a tone should be "sent freely into the head back of the uvula, where the overtone factor becomes more prominent and gives shimmer to the tone."[36] Golde indicated that such a tone was aided and abetted by a low larynx. His reference to the overtone factor and the low larynx indicates the use of the Direct Approach, while his use of the term "float" indicates the use of imagery, or the Indirect Approach. Husler is another who uses primarily an Indirect

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[32]Kisselburg, "Corrective Vocal Techniques for Certain Speech Difficulties," p. 11.

[33]Gould, "Phonation," p. 7.

[34]"Quiz Cove," February, 1968, p. 37.

[35]Golde, "Cultivated Spontaneity," p. 12.

[36]Ibid.

Approach but includes some direct instruction. He speaks freely of "placing" the tone and contends that this is using one's imagination. Patricia Mahon reports that Husler was careful to state that "while the thought is of placing, the muscles should act by impulse and not be directed."[37] The concept of muscles acting on impulse is another way of saying that total coordination is needed. The total coordination of muscles acting on impulse is gained by long hours of voluntary practice until such actions are thought of as impulses. Such action is therefore brought about by a combination of approaches.

The method of achieving ring by means of associating sung tones with speech sounds is often thought of as an Indirect Approach. When certain words are spoken which contain the ring or 2800 cycles per second, the student is instructed to sing or elongate such sounds, comparing and adjusting until a similar ring is found in all other vowel sounds. This method is referred to by MacRae when he states: "The best possible tone produced is through a supple open throat with the word spoken on the lips."[38] Vennard explains that the method of acquiring ring by means of "singing as you speak" should be revised to say "sing as you should speak."[39] He maintains that the old Italians taught correct pronunciation as the key to bel canto and the idea is found in almost all books of singing. Furthermore, the "mechanistic teacher" finds the phonetic approach congenial because of its emphasis on objective details such as the position of the

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[37]Mahon, "The British Summer School of Music," p. 27.

[38]MacRae, "Breathing and its effect on Singing."

[39]William Vennard, "A Message from the President," The Bulletin, XXI (October, 1964), p. 1.

tongue, the opening and closing of the nasal port, and the separation between the teeth. The vowels [e] and [i] also intensify or help to create ring because "the same muscles that shape the resonators also exert pulls upon the larynx and modify the primary vibration independently of pronunciation."[40]

The "psychological teacher" uses the Indirect Approach because speaking seems to be a natural habit and lends itself to teaching by comparison to a skill already mastered. Vennard, however, points out that speech is not natural but a learned skill because the primary function of the organs used in speech is to effect the first stages of digestion, i.e., chewing and swallowing.[41] Many who are negative to speech oriented methods of acquiring ring argue that local dialects and inhibitions imposed upon speech by society tend to make it a poor means of teaching students. Vennard agrees, but adds that "singing is even farther removed from the primary function of the organs than is speech, and if he [the singer] can return to speech, it may benefit him."[42] Consequently, it became obvious to teachers using either approach that achieving ring by comparison to speech sounds is a method which can be used by any teacher, depending on the need of the individual student.

The "mechanistic teacher," as in all else, often approaches the mastery of ring by direct means. Frequently the "mechanistic teacher" wants to share information about some vocal technique with his students, believing that the student should know as much as possible about the physiological aspect of singing. Robert M. Taylor, relating such

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[40] Ibid. [41] Ibid., p. 34 [42] Ibid.

information, states: "Voice training consists of focusing or placing the voice, which means discovering the proper arrangement of cavities to supply the correct resonance for any given pitch."[43] Even though the scientific application of the term resonance makes "no allusion to tone color, dynamics, or any other ingredient of good singing," the proper arrangement of cavities results in a more efficient amplification of the fundamental and its overtones.[44] Thus, the more efficient amplification augments strong overtones, giving the voice a "richer" color and making singing easier because the presence of overtones are detected more readily by the human ear.[45] If the condition of tight coupling and a high degree of resonance between the vocal cavities is present, the sound wave is reflected to return to the vibrator in time to join the next wave, which will add to the efficiency of the operation promoting ease in singing. Conversely, if the coupling is not as tight with a lower degree of resonance between the cavities, the reflected sound wave is delayed causing a collision with the next wave which inhibits the efficiency of the operation and causes unnecessary tensions.[46]

Newell H. Long, speculating about the ring to the voice, says: "A great deal of that which is spoken of as voice placement is the attempt to employ the least absorbent reflecting surfaces in the oral cavity and to shape the cavity so that the reflected sound waves will travel back to the vocal cords in time to coincide with the reflected

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[43]Robert M. Taylor, "Acoustics as an Aid to Ease of Singing," The Bulletin, XII (November, 1955), p. 20.

[44]Taylor, Acoustics for the Singer, p. 20.

[45]Ibid. [46]Ibid., pp. 17, 31.

waves thereby creating resonance."[47] Stults indicated in his review of W. E. Brown's book that Brown approved of arousing the correct muscular action to produce or place tones.[48] Husson indicated in his findings that both hearing and the tonus of the laryngeal sphincter was responsible for efficient "bright" or "piercing" quality of the voice.[49] Moreover, Vennard says that "placement" is an illusion created by the laryngeal adjustment.[50] He also gives scientific findings by Fritz Winckel and Wilhelm Ruth which explain why ring to the voice is an illusion. Winckel says: "The better-sung tones have fewer formants with added power concentrated in them."[51] Ruth confirms what Winckel says and adds: "It gives a basis for the concept of placement since the few powerful formants awaken sympathetic vibrations which can be felt in the bones of the face."[52]

Humming is a sensation which has been used as an aid in securing the ring to the voice. Fields said that "many teachers utilize the humming sound of the voice as a guide to voice placement,"[53] while others since Fields have continued its advocacy in achieving ring. Vennard maintains that the hum or some form of nasality is likely to be

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[47]Newell H. Long, "Some Things a Voice Teacher Should Know About Sound," The Bulletin, IX (March, 1953), p. 6.

[48]Stults, "Bookshelf," February, 1957.

[49]Husson, "How the Acoustics."

[50]Vennard, Singing, the Mechanism and the Technic, p. 120.

[51]William Vennard and James W. Irwin, "Speech and Song Compared in Sonagrams," The Bulletin, XXIII (December, 1966), p. 22.

[52]Ibid. [53]Fields, Training the Singing Voice, p. 143.

used by many teachers to develop "intensity" or ring to the voice.[54] Lindquest also suggests the use of the hum in "maintaining that shimmering, dangling quality of tone so peculiarly characteristic of both Flagstad and Bjoerling."[55] Similarly, Laudesia says that to maintain the vowel line or ring, the tone must be based upon the hum in an open throat.[56] Lindquest prefers the [nɪ] to start phonation with a very gradual opening into the vowel which contains the essential ring to the voice.[57] Newton says that his first exercise for a new student "involves a m-hum with a buzz on the lips, the most obvious sensation for a beginning student; and I combine this with the vowel ah, which I try from the first to bring forward in the Italian manner."[58]

For years Vennard used what he called "hum on the tongue" exercise to achieve ring to the voice. This method was an elaborate vocalizing ritual using the hum with the blade of the tongue held loosely between the teeth. He described the ring to the tone as "coming up out of the throat, gathering nasal brilliance, and dropping down into the mouth far forward, between the tongue and teeth."[59] Later he said that he regretted his usage of the imagery term "nasal brilliance" but the remainder of his metaphorical sentence was still satisfactory to him.[60]

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[54]Van den Berg, "Toward an Objective Vocabulary."

[55]Lindquest, "Security in Singing," p. 2.

[56]Laudesia, "The Impact of Effective Singing."

[57]Lindquest, "Security in Singing."

[58]Newton, "The First Singing Lesson."

[59]Vennard, Singing, the Mechanism and the Technic, p. 127.

[60]Ibid.

More recently he has used the sound produced by what he once called "the open hum" using the [ae] sound to induce ring in the voice.[61] Vennard suggests both direct and indirect methods of achieving the ring by this method. He says that the hum that seems to be forward is the one in which the vibrations pass freely into the mouth; but if the hum is faulty, one should check the physical conditions of the tongue, velum, and oral cavity.[62] It should be understood that since the hum is produced in the nasal cavity, this cavity serves as a filter rather than a resonator for the tone. Thus, the sensations experienced by humming are a result of the absorption of energy which sometimes serves as a helpful aid in achieving the ring to the voice.

Vennard concludes that the laryngeal function responsible for the ring of the tone can be controlled "by the ear, the memory of past experience, and poetic suggestion."[63] Thus, Vennard underscores the importance of using a combination of approaches. He continues by saying that the teacher's verbalization:

> . . . is useful only as an accompaniment of the actual sensation--partly kinesthetic and partly auditory. By some device--mechanistic, demonstrative, or merely trial and error--the teacher must lead the student into the experience, and he will then perhaps distinguish it from other experiences by appropriate words.[64]

The Mouth and Throat as Resonators

In describing the mouth and throat cavities, Fields says "the simplest physiological concept regarding these cavities is that they form a more or less continuous passageway interrupted only by the various

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[61] Ibid. [62] Ibid., p. 173. [63] Ibid., p. 96.

[64] Vennard, "A Message from the President," February, 1965.

curves and contours shaped by muscular and cartilaginous protuberances."[65] Since Fields' publication, scientific investigation has proved that the cavities of the mouth and throat are the main cavities which determine the kind of quality a person produces. Fields defines "quality" as a property of tone which "distinguishes it from another tone having the same pitch, loudness and duration. It is the identifying character of a sound determined chiefly by the resonance of the vocal chambers uttering it."[66] Fields reflected the lack of agreement among scientists of the Forties when he cited Robert Curry, who claimed that the physiological and acoustical experts of his day found it difficult to decide what the resonating functions of the oral and pharyngeal cavities were during singing.[67] Authorities today are more in agreement because of the great advances made by scientific investigation.

The oral cavity, with a volume of about 100 cubic centimeters, is the area from the mouth to the pharynx which extends from the pillars of the fauces to the labial orifice. Its size and shape may be changed by "the movement of the mandible, tongue, and the lips."[68] The pharynx joins the oral cavity, having a volume of about eighty cubic centimeters and approximately four and one-half inches in length, extending from the base of the skull to the level of the sixth cervical vertebra.[69] The pharynx may be subdivided into three separate cavities called the nasopharynx, oropharynx, and the laryngopharynx (Fig. 1).

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[65]Fields, Training the Singing Voice, p. 137.

[66]Ibid., p. 141. [67]Ibid., p. 137.

[68]Appelman, The Science of Vocal Pedagogy, p. 74.

[69]Ibid.

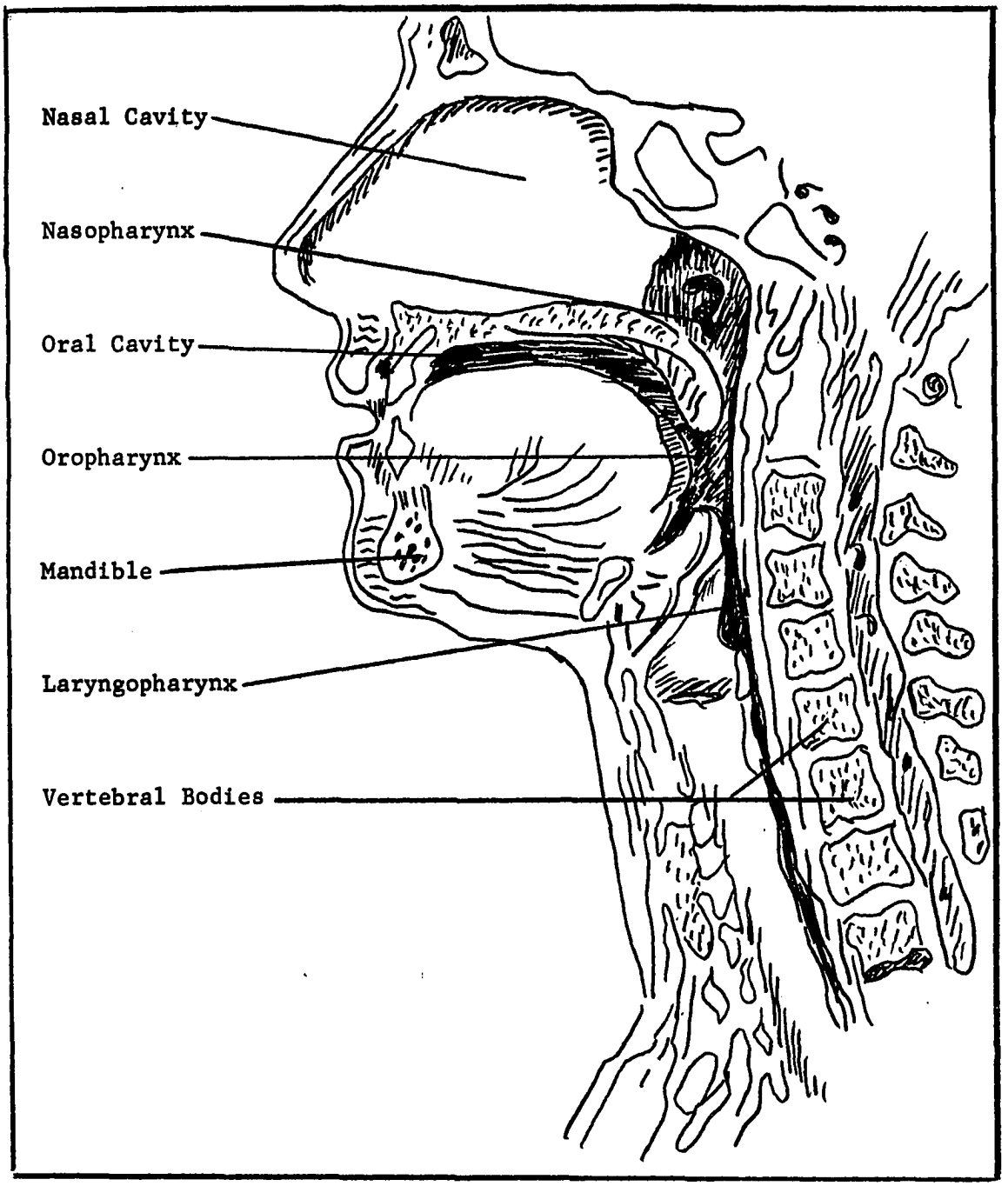

Fig. 1. The Human Resonation System, Lateral View

Showing the Nasal Cavity, Nasopharynx, Oral Cavity, Oropharynx, Mandible, Laryngopharynx, and the Vertebral Bodies. From the Ciba Collection of Medical Illustrations by Frank H. Netter, M.D.

Influenced by early experiments of Paget and Russell, Appelman says that the oral cavity and each cavity of the pharynx contribute a quality component to the tonal spectrum by being a part of a system which may be coupled with one another during the production of all sounds.[70] Van den Berg says that the vocal cavities, forming the resonator coupled with the glottis-generator, form a unit which may seem artificial to separate, but must be done because "it is impossible to understand the functions of the unit without a knowledge of the properties of the components."[71] When vibrations leave the larynx or generator, they can do four things: "be reflected by hard surfaces, reverberate within a cavity, be transmitted through tissues to bony structures, setting them in vibration; or be absorbed in tissues through muscle tensions becoming poor for transmission."[72] It is important to remember that soft-walled resonators, unlike resonators of metal, "can respond to many different frequencies and are able to reproduce many different gradations of tone quality."[73]

Van den Berg says that differing qualities are caused by the way overtones are strengthened in different patterns for various vowels and the formants are damped by friction in the narrow passages along the vocal tract and "by sympathetic vibrations of the walls of the cavities,

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[70] Ibid.

[71] Van den Berg, "On the Myoelastic-Aerodynamic Theory of Voice Production," The Bulletin, XIV (May, 1958), p. 6.

[72] Westerman, "Resonation."

[73] Appelman, The Science of Vocal Pedagogy, p. 118.

particularly those of the throat."[74] The passed or reflected harmonics "bunch into formants or frequency regions of greater energy on the spectrum."[75] Berton Coffin, reporting findings from an experimental study in association with John Howie and Pierre Delattre, said that the term formant refers "to the selective resonance in a particular frequency region which contributes to the timbre of a complex tone."[76]

Michel Landeau gives information about the physical properties of agreeable quality saying the "timbre is composed of the fundamental sounds of its harmonics and other partials or non-harmonics."[77] He goes on to say that timbre is also "resultant of reinforcement by the resonators of the fundamentals and of certain harmonics supplied by the larynx."[78] Paul B. Oncley adds that the motion of the vocal cords and the air particles is neither simple nor symmetrical causing generated sounds of higher vibration rates known as overtones, which have a large role in determining the quality of a tone.[79] Newell Long contributes more information saying that since the sound energy seldom distributes itself evenly or in regular patterns over the fundamental and its overtones, "the tendency of certain frequencies to be strong through

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[74]Van den Berg, "On the Myoelastic-Aerodynamic Theory of Voice Production."

[75]Pierre Delattre, "Vowel Color and Voice Quality," The Bulletin, XV (October, 1958), p. 4.

[76]John Howie, Pierre Delattre, and Berton Coffin, "An Experimental Study of the Effect of Pitch on the Intelligibility of Vowels," The Bulletin, XVIII (May, 1962), p. 6. (Hereinafter referred to as "An Experimental Study.")

[77]Landeau, "Voice Classification," p. 5. [78]Ibid.

[79]Paul B. Oncley, "What Acoustics Means to the Teacher of Singing," The Bulletin, VIII (September, 1951), p. 8. (Hereinafter referred to as "What Acoustics Means.")

emphasis of the nearest overtones is the means by which each instrument or voice has its particular, identifying quality."[80] Delattre says that formant frequency causes two vowels to be perceived as the same or different from one another. Furthermore, voice quality is "mainly characterized by the two or three formants whose frequencies are just above the vowel formants."[81] He indicates that a singer obtains "richer" sounds by increasing intensities with higher frequency overtones than needed for speaking. Richer tones are produced by a "longer closure and shorter opening of the glottis in each cycle, thanks to stronger musculation and a wider contact of the vocal cords resisting to stronger breath pressure."[82]

G. K. Daghlian describes the acoustical occurrences more simply by saying that when "middle C" is sung, "air waves at the rate of 256 per second are produced. This is known as the fundamental, and it alone determines that it is the 'middle C.' But along with this fundamental there are produced many other vibrations, all multiples of 256. These latter are known as the overtones."[83] He says that the methodological factor which determines whether or not a tone quality is agreeable or not is determined by the mechanical and anatomical conditions where it is produced.[84] Similarly, Delattre maintains that to achieve an

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[80]Long, "Some Things a Voice Teacher Should Know about Sound," p. 16.

[81]Delattre, "Vowel Color and Voice Quality," p. 5. [82]Ibid.

[83]G. K. Daghlian, "Song and its Acoustics," The Bulletin, VIII (November, 1951), p. 18.

[84]Ibid.

agreeable quality "the vowel strictures at the tongue and lips must be wider than for spoken vowels" because the best conditions for speaking require the presence of constrictions along the vocal tract.[85] He continues by saying: "The best conditions for singing require the absence of such constrictions in order to allow the high frequency overtones that characterize voice quality to be passed by the resonating cavities."[86]

Landeau cites Tarneaud, who says that sombre or clear color is achieved by the relationship of the resonators and the texture or mordance of the voice bound by the tonicity of the vocal cords.[87] Westerman maintains that "muscle tension which creates a cavity with hard surfaces tends to keep the tone vibrations confined to the cavity and give the tone a quality determined by that cavity's vibration rate."[88] Many authorities make reference to earlier studies made by Oscar G. Russell who said that the shape, texture of resonator walls, and the function of the laryngeal muscles affect the quality of the voice.[89] Vennard points out that in the process of acquiring correct quality, a student's arching the velum in the back of the throat will cause a stretching of the posterior pillars. He says this stretching

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[85]Delattre, "Vowel Color and Voice Quality."

[86]Ibid.

[87]Landeau, "Voice Classification."

[88]Westerman, "Resonation."

[89]Oscar G. Russell, The Vowel (Columbus: Ohio State University Press, 1928).

sensation in the throat agrees with those who advocate a certain firmness in the throat associated with an agreeable tone quality.[90] The methodology often used to acquire this condition is accomplished by the beginning of a yawn. It should be emphasized that only the beginning of the yawn is desirous because the latter part of the yawn produces excessive tension. The preparation of a yawn not only automatically lowers the larynx but enables the student to become aware of the correct firmness of the throat by retaining the same opening caused by quick inhalation.

Another factor which determines vocal quality is the size and shape of the resonating cavities.[91] The sound passes from one resonating cavity to another creating a reinforcement of harmonic components of the fundamental and gives partials greater energy at the point of cavity resonance or is weakened and damped out by unfavorable conditions in a cavity. Consequently, every change in the size or shape of the resonating cavity creates its own set of characteristic formant frequencies which determines the emitted quality of sound.[92]

The changes that are possible within the vocal tract are many, including the possible changes of the mandible, tongue, soft palate, or the movement of the larynx. These can either be changed directly, indirectly, or by a combination of both methods. These changes can also create a system of cavity coupling with vibrations in one cavity

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[90]Vennard, Singing, the Mechanism and the Technic, p. 157.

[91]Howie, "An Experimental Study."

[92]Appelman, The Science of Vocal Pedagogy, p. 126.

inducing vibrations in adjoining cavities. Robert Taylor says the desired results in singing are obtained by correct cavity interrelationships involving conductivity factors and not by "the continuous expansion of those cavities."[93] A cavity coupling system is referred to as tightly coupled or loosely coupled, depending upon "the degree of constriction at the orifices which join such a system."[94] A loosely coupled system is one in which the influence exerted by one resonating cavity upon another is small. Such influences are caused by the tense vowels of [i], [e], [o], and [u]. This loose condition is created by dividing the mouth and throat into small cavities by the position of the tongue. As the tongue is moved forward enlarging the back orifice, the [a] is formed which is the most tightly coupled vowel with little or no tongue stricture.[95]

Appelman gives distinct physiological instruction about the cavity coupling necessary for each vowel. He uses a combined method of analyzing the acoustics, position, and movement of necessary parts to create each sound with drills, photographs, and x-ray pictures illustrating the preferred positions. His predominantly direct instructions also include indirect directions concerning the production of phonemes and migration positions which are "accomplished psychologically, but dependent upon physiological directives."[96] Taylor believes that "the combining of the various cavities to create proper resonance is

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[93]Robert Taylor, Acoustics for the Singer, p. 15.

[94]Appelman, The Science of Vocal Pedagogy, p. 128.

[95]Ibid. [96]Ibid., p. 222.

not a matter of absolute dimensions but a matter of relative dimensions and inter-relationships."[97] Taylor also indicates that as long as the student wants to improve his voice he should continue to search for a "more efficient combination of the factors of resonance."[98] This search will necessarily be conducted primarily by trial and error, "always holding in mind a tone goal to be achieved."[99] Therefore, regardless of whether the teacher prefers to teach by direct or indirect methods, he "should know the basic laws of acoustics and the principles on which the voice operates."[100]

The Chest Cavity as a Resonator

There has been an important change in the acceptance of the concept concerning the chest as a resonator since the publication of Fields' book. Fields states that the observations of authors related to the concept of the chest being a resonator were expressed by two main points of view: "Namely, whether the air space alone in the chest constitutes a resonator or whether the bony and muscular walls of the chest contribute to vocal resonance."[101] Generally speaking, contributors to The Bulletin have rejected both of the ideas expressed by Fields, especially the first. Stults, quoting Fillebrown, says: "Chest tones, closed tones, open tones, etc., as confined to special parts of the vocal range, are distracting distinctions arising from

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[97] Taylor, Acoustics for the Singer, p. 30.

[98] Ibid., p. 25. [99] Ibid.

[100] Ibid., p. 8.

[101] Fields, Training the Singing Voice, p. 138.

false education."[102] Similarly, Fredrich S. Brodnitz, answering a question in "Quiz-Cove," said: "The question seems to be based on the old misconception that deep tones are produced in or are directed toward the chest and high notes, the head."[103] Vennard says the same thing, referring to "chest resonance" as a relic of former days, and indicates that we must not allow ourselves to include the chest in our list of resonators.[104] He suggests that resonators are cavities of air; therefore, the chest is not a resonator because it is not a cavity but filled with soft spongy material. Vennard has used scientific data provided by Van den Berg to prove that the trachea and bronchi are resonators, but are "more of a hindrance than a help."[105] He continues by saying that "the resonance of the trachea and bronchi is the same for all the sounds any voice can produce."[106] Furthermore, the larynx has to compensate for the acoustical impedance created by the resonance caused by the trachea and bronchial resonators. He goes on to say that "the trachea may cause register difficulties, but these are corrected by acquiring laryngeal skill, not by adjusting the trachea."[107] Appelman lists four cavities that are stable enough to act as resonators and includes the trachea as one with the capacity of thirty-five cubic centimeters. He says that "tomograms reveal a

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[102] W. A. Stults, "Book Shelf," review of Resonance in Singing and Speaking by Thomas Fillebrown, The Bulletin, XIII (February, 1957),

[103] "Quiz Cove," May, 1967.

[104] Vennard, Singing, the Mechanism and the Technic, p. 85.

[105] Ibid., p. 86. [106] Ibid., p. 89. [107] Ibid., p. 96.

tracheal alteration--a bulbous enlargement below the base of the cricoid cartilage--during the production of high pitches and increased vocal force. This condition appears in all voices."[108]

Entire Body as a Resonator

To a great extent, the assumption that the entire body is a resonator has been discarded as being scientifically impossible. The idea that the body is the "sounding board" of the voice is also not accepted today, although it was a common belief during the period which preceded Fields' book.

Conclusion

Few terms in vocal pedagogy have been associated with as many varied definitions in the past few decades as "resonance." The term has been misused as a synonym for general tone quality as well as specific types of quality such as ring, depth, and/or warmth of a tone. Although many continue to use the term indiscriminately, more enlightened teachers progressively use "resonance" according to its scientific definition. Thus, in singing, resonance is the harmony or relationship of frequencies between the resonators and the vibrator.

Much scientific knowledge has been gained about the physical qualities of sound since the Forties and the information available at this time has changed much of the methodology used in teaching singing. The information gained about the physiological factors involved in creating resonance has led contemporary vocal authorities to negate

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[108]Appelman, The Science of Vocal Pedagogy, pp. 74, 79.

head cavities above the mouth as resonators. For instance, scientists today agree that the sinuses do not add anything to the tone, whereas, before Fields' publication, the majority of opinions favored the idea that the sinuses were valuable in creating resonance. A similar situation has occurred in the acceptance of the nasal cavities as being consciously employed to gain resonance. The majority in Fields' book favored the idea of conscious employment of the nasal cavity as a resonator which contributes to agreeable quality. Today this has been discarded and the sensations felt in the nasal area have been explained as results of the absorption and dissipation of vibratory energy in the muscles and bones of the face and head. Vennard says that this sensation is valuable because it is part of a circuit which affects the larynx by way of the ear. Impaired hearing is prevalent enough for the teacher to be aware of the possibility of students being affected to the degree that normal monitoring of sounds by the ear may not be possible. In some cases the student may need to learn to monitor the sound "by the way it looks and feels rather than by the sound alone."[109] Nevertheless, all students should profit from Husson's experiments, which proved that the nasal cavity is not a part of the pharyngo-buccal vocal spectrum causing what was formerly thought of as "nasal resonance" but a filter which removes certain elements of the input mixture.

The clarification of the term focus and the acoustical and physical characteristics of the quality is a very important advancement in the field of vocal pedagogy. The accurate description of how focus is

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[109]Wendel Johnson, et al., Speech Handicapped School Children (New York: Harper and Row, Publishers, 1956), p. 390.

achieved and the realization that the term itself is a figure of speech helps teachers to understand how both the Indirect and Direct Approaches can be used to achieve this essential characteristic ingredient of an agreeable tone. This clarification of terminology and the understanding of techniques used by both the "direct" and "indirect" teacher is a major accomplishment which has come about to a significant degree in the past twenty-four years.

Another important change has emerged concerning the importance of the mouth and throat cavities as resonators. Fields reflected the lack of agreement among scientists of the Forties when he cited Curry, who claimed that the physiological and acoustical experts of his day found it difficult to decide what the resonating functions of the oral and pharyngeal cavities were during singing. Today not only have the cavities been defined, but they have been measured and their functions described in detail. Now it is known that each cavity of the mouth and throat contributes a quality component to the tonal spectrum by being a part of a system which may be coupled with one another during the production of all sounds. Overtones are strengthened in different patterns for various vowels and the formants may be damped by friction in the narrow passages along the vocal tract or by the lack of muscle tonus in the walls of the cavities. Vibrations that leave the larynx or generator can do four things: (1) be reflected by firm surfaces, (2) reverberate within a cavity, (3) be transmitted through tissues to bony structures, or (4) be absorbed in tissues through muscle tensions, becoming poor for transmission.

All of these conditions can be achieved by either direct or indirect methods. The correct firmness of the surfaces can be produced by the beginning of a yawn which has been described as being accomplished by a combination of approaches. The reverberation within a cavity can be controlled by cavity coupling, and the transmission of vibrations through tissues depends upon the firmness of the muscles, both of which can be achieved by a combination of approaches. Another important factor known today is that the size and shape of the resonating cavities determine the emitted vocal quality. Consequently, every change in the shape and size of the resonating cavity creates its own set of characteristic formant frequencies causing individual qualities. The use of both indirect and direct methods in achieving the correct mouth and throat controls has already been presented in the preceding chapter.

The methodology dealing with the mechanics of obtaining desirable tone quality are presented largely by the aids of hearing and sensations experienced by the student. Many place great emphasis upon the use of the student's ear in teaching him to guide himself in practice. It is believed that the unimpaired ear is the primary point of control the student has in appraising his tone quality and he should learn how to produce a quality with the most freedom and efficiency through the teacher's guidance. A popular method used to help the student learn how to guide himself in obtaining his best quality is by helping him find one tone with good quality and suggesting that he compare and adjust all other sounds with the agreeable sound. Closely associated with the ability to hear and compare is the technique of

recognizing sensations and using them as a guide to improve quality. The majority of opinions expressed endorse the importance of both "hearing" and "feeling," and the investigation of methods using these aids in achieving desirable quality indicates that both the Direct and Indirect Approaches are used.

Both approaches are used in achieving the desired tonus of muscles activated by reflex actions which occur as a result of changes in acoustical pressures in the pharyngo-buccal cavity. Husson made a study of this reflex action which makes singing in the open air disagreeable to many singers. As the reverberation around the singer lowers, "he progressively feels his phonatory euphoria give place to a disagreeable sensation of 'cotton in the mouth' while the voice whitens."[110] A singer warned of this reflex action which results from improper acoustical environment can be prepared to expect less satisfaction in the area of "feeling" and "hearing" and actively seek to sing with ease and freedom regardless of the sensations he experiences. However, whether a student hears, feels, or is directed to make a physical change to improve his quality, it is necessary for him to make conscious efforts to change the resonating chambers, and this involves both the voluntary and involuntary actions of participating muscles. These muscular changes can be made by either direct or indirect means, depending upon the nature of the individual. In the majority of cases, the teacher is called upon to use a combination of both approaches to obtain the desired quality.

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[110]Husson, "The Pharyngo-buccal Cavity and its Phonatory Physiology," p. 8.

CHAPTER VI

MODULATION

Although Fields primarily discussed compass and registers of the voice under the heading of "range," these topics represent only a part of the over-all subject of modulation. "Modulation" serves as a more accurate heading for the discussion of changing pitches, classification, compass, and registers of the singing voice. Contrasts and changes of the chosen topics are again presented with the major emphasis upon the opposing methodological approaches.

Until recently the process of changing pitch was limited to mean the change from one frequency to another. Current views have been influenced by more accurate information concerning pitch. According to Stanley Stevens and Hallowell Davis: "Pitch is chiefly a function of the frequency of the sound, but it is also dependent upon the intensity and timbre of the sound."[1] Appelman says that pitch for the singer depends upon intensity to a great degree and the relationship between pitch and intensity must be maintained in order to keep a tone at a constant level.[2] Robert M. Taylor observes that there is a difference between intensity and loudness. Intensity is a physical factor

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[1]S. S. Stevens and Hallowell Davis, Hearing (New York: John Wiley and Sons, Inc., 1963), p. 451.

[2]Appelman, The Science of Vocal Pedagogy, p. 146.

measurable by machines, whereas loudness is determined by the individual's awareness of the sound.[3] Since there are differences in human beings, "there will be differences in judgments as to the degree of loudness."[4] There is also a difference between frequency and pitch. Taylor defines frequency as "the number of measurable vibrations of a medium per second, while pitch is the interpretation of that frequency by the human ear."[5] Therefore, pitch is not only dependent upon physiological factors, but psychological factors which are determined by the individual's interpretation of what he hears. In a recent article, Fields gave a summary of opinions concerning the determinants of vocal pitch based on a bibliography which included more than a thousand sources:

> Our findings include several. They are listed as density, thickness, width, and longitudinal tension; that is to say, those factors that affect the firmness or elasticity of the glottal margins. The degree of breath pressure directed against the underside of the glottis is also considered a pitch factor and a chronaxic theory of timed nerve impulses is also advanced.[6]

Fields also says that the vocal cords do not change in length appreciably throughout the vocal compass. Thus, pitch factors need to be "considered in terms of variations within the vibrating medium, supplemented, of course, by external mechanisms that make these changes possible."[7] Along with the changes in concept concerning the

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[3]Robert M. Taylor, Acoustics for the Singer, p. 20.

[4]Ibid. [5]Ibid., p. 21.

[6]V. A. Fields, "Review of the Literature on Vocal Registers," The Bulletin, XXVI (March, 1970), p. 37.

[7]Ibid., p. 38.

psycho-physiological characteristics of pitch came a more accurate understanding and effective methodology dealing with the associated subjects of classification, range, and registers of the voice.

Vocal Classification and Range

Although Fields said the majority of authors at the time of his publication favored "quality" as a criterion for classifying voices, others proposed the use of range.[8] Current views maintained that more than quality and range was involved in determining vocal classification; therefore, further investigation was deemed necessary. According to Vennard, the majority of men, if classified, would be baritones, and the majority of women would be mezzo-sopranos, but this might be misleading because many untrained baritones or mezzo-sopranos have not learned how to take advantage of their unused registers and the lack of exercise would tend to limit their ranges.[9] The unusual voices are the extremes such as the bass, tenor, alto, and the high soprano. These classifications can be subdivided by combination or with qualifications such as lyric, mezzo, or spinto. While a well-trained voice may have a compass of two octaves or more with a singable and pleasing quality, it is possible to make grunts and squeaks both lower and higher. Arbitrary limits for the various voices could place the average range for the bass voice to include "E" below the bass staff to "E" above it, with the baritone's range lying about a third higher, while the tenor is often expected to reach "C" above "middle C." Altos may be considered

[8]Fields, Training the Singing Voice, p. 65.

[9]Vennard, Singing, the Mechanism and the Technic, p. 78.

as having a range similar to the bass but an octave above with the mezzo comparing to the baritone, and the soprano comparing to the tenor.[10]

At the least, musical compositions have indicated a distinction between high and low voices since the earliest plain-chant. Each division included only nine or ten tones with the high voice placed about three or four tones above the low voice. Music for the medium voice did not appear until the eighteenth century, and it was written primarily for women. The well-defined vocal types and their subdivisions became established during the nineteenth century. After Garcia's development of the laryngoscope, voices were classified according to the length of the vocal cords, accepting the idea that low voices had long cords and high voices had short cords. Many, like Merrell Mackenzie, did not accept the idea that the length of the vocal cords had anything to do with the classification of voices.[11] Cunaud reported that it was impossible to measure the vocal cords accurately with the laryngoscope because the posterior insertions are rarely visible at the same time.[12] To add further evidence, Husson said that Caruso had long cords which would have classified him below a bass voice, and Labriet, a basso cantante, had short cords.[13] Also, according to Husson: "No significant correlation exists between the vocal type on one hand and the length of the vocal cords on the other."[14] Another generally

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[10]Ibid., p. 79.

[11]Raoul Husson, "The Classification of Human Voices," The Bulletin, XXIII (May, 1957), p. 6.

[12]Ibid. [13]Ibid., p. 7. [14]Ibid.

accepted assumption was made by Thooris van Boore, who classified vocal types according to the anatomical characteristics of human beings.[15] Those with lean and straight bodies were thought to have high voices while the rotund in build had low voices. Husson says that "any correlation between vocal type and morphology of the singer is an illusion."[16]

Husson, reporting his findings and those made by Christian Chenay between 1953 and 1957, established the concept that the "tonal characteristics of the human voice are a function of a solid and unique physiological factor--the excitability of the recurrent nerve."[17] Jean Tarneaud, an associate of Husson at one time, gives the vocal teacher more immediately useful information, even though it is quite empirical in nature. Tarneaud maintains that sonority and range are indisputably linked to the dimensions of the vocal cavities. Tarneaud uses a simple test of checking the sonority of the student's cough to determine the classification of the voice. He suggests making the cough sonorous by producing the vowel [e] during the cough, which permits him to gauge the pitch produced. Tarneaud uses an illustration of a student who was hurting himself as a baritone and by the "voiced cough" found that the student's fundamental tone was "D" above "middle C." According to Tarneaud, this information proved that the student should be classified as a tenor.[18]

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[15] Ibid.

[16] Ibid.

[17] Ibid., p. 9.

[18] Jean Tarneaud, "A Psychological and Clinical Study of the Pneumophonic Synergy," The Bulletin, XIV (February, 1958), p. 15.

Silvia Bagley thinks teachers might get better results if they would not insist that every voice be put into a definite classification immediately because there are many voices which are "in-between" classifications. Although these voices will not fit into any particular category at the time of classification, they are capable of producing pleasing sounds.[19] It is also evident that average audiences rarely care what voice classification they hear, but are more interested in the beauty and interpretative qualities the singer possesses. The "in-between" voices may not be able to sing the standard operatic or oratorio repertoire, but there is a great deal of worthy literature available to them.[20] Voices with limitations in dynamics, quality, or range may be the result of imperfect training, stunted or insufficient growth, or inadequate equipment.[21] According to Fields: "These half-grown voices cannot rightly be classified, since the singers may at any time grow out of them with proper training."[22] Preliminary classifications are sometimes used for instructional purposes, but the student should be reminded that the classification is temporary and a change may take place after the student has matured.[23]

Alberti maintains that the limited range is due to the lack of anchorage for the tone caused by the displacement and strained condition

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[19]Silvia R. Bagley, "About Unclassifiable Voices," The Bulletin, III (June, 1947), p. 2.

[20]Ibid.

[21]V. A. Fields, "Quiz Cove," The Bulletin, XX (October, 1963), p. 38.

[22]Ibid. [23]Ibid., p. 39.

of the tongue and larynx.[24] Consequently, when the tongue and larynx are strained or displaced, the voice is robbed of its natural function and the high and low notes cannot be sung.[25] Others point out that since the voice has a natural range, to force the voice higher or lower causes injury. Brown, discussing the causes of voice strain, defines the "forced range" as a range which is achieved by "trying to reach notes that do not lie easily within the compass of the voice."[26] He maintains that a singer should be concerned about what notes he can produce best rather than how high or low he can sing. Therefore, a voice may be guided safely by considering "what the voice can do naturally rather than by what one would like to make the voice do."[27] Lloyd Mallet also maintains that every voice has its peculiar native range, but "many singers have pushed the natural span of tones out of their [sic] original setting by working forcefully for more range."[28] Mallet admits that nearly every singer is guilty of trying to sing louder, higher, longer, lower, and much better than nature intended because he wants to do his best and accomplish as much as possible.[29]

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[24]Alberti, "Facts Concerning the Art," p. 4.

[25]Ibid.

[26]Brown, "Causes of Voice Strain," p. 21.

[27]Brown, "Principles of Voice," p. 21.

[28]Lloyd Mallet, "Some Vocal Training Ideas Re-explored," The Bulletin, XX (October, 1963), p. 10.

[29]Ibid., p. 11.

Although Landeau says that the task of classifying a human voice is a delicate problem which seeks a sure and precise method, he maintains that the only valid procedures are the "empirical" and "scientific" methods.[30] Empirical procedures, based on the study of quality and tessitura, are recognized as containing debatable values, but when followed by experienced teachers, often attain good results. Serious errors in classification can result from the use of quality as a sole criterion for classification because a child involuntarily mimics the sounds of his family and regional environment creating a quality and tessitura which is artificial to him. On the other hand, the scientific classification of voices is "built on anatomic and phylologic bases."[31] For instance, the shape and size of the bucco-pharyngeal resonators have a direct influence upon the quality and tessitura of the voice. Landeau advises against the idea of using the neurologic sources of vocal classification derived from Husson's neuro-chronaxic theory as a basis for classification because his experiments did not agree with Husson's findings. He warns that it is dangerous for teachers to exploit theories before they have been proved.

Landeau says that one should approach the classification of voices with great care because classification "cannot be definite, and the voice evolves amid established limitations, under influence of hard work and duration of time."[32] He also warns that "voice classification cannot be set in too rigid a category nor spared coming to

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[30] Landeau, "Voice Classification," p. 5.

[31] Ibid., p. 6.

[32] Ibid., p. 31.

terms with mathematical formulas."[33] Although students generally want to be classified as soon as they sing for a teacher, a premature diagnosis may prove to be incorrect, causing embarrassment to the teacher and harm to the student as he continues to strive for an ill-chosen goal.[34] Both student and teacher are usually interested in developing the widest range possible for the student, but this is accomplished by exercise and maturity rather than by instant methods.

Registers of the Voice

Fields includes the discussion of registers primarily under the topic of "Theory of Registers," but current methods of using the vocal registers in cultivating range are so closely associated with the physiological factors that both will be presented together. The term "register" is thought to mean a series of tones which are similar in quality and produced by a muscular adjustment of the vocal cords. As one ascends or descends the scale, the singer must adjust the vocal cords at varying points for the group of tones in a particular register. The change of muscular adjustment from one register to another is called the "break" between registers because many students cannot continue the same quality from one register to the other without a noticeable change in sound.[35]

The problem of voice registers has been discussed since the beginning of recorded history of training the human voice. In the

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[33] Ibid.

[34] Vennard, Singing, the Mechanism and the Technic, p. 78.

[35] Ibid., p. 77.

thirteenth century, John of Garland wrote: "It must be known that the human voice exists in three forms: it is a chest voice, throat voice, or head voice."[36] About 1250, Jerome of Moravia said: "Certain voices are of the throat, certain of the chest and certain actually of the head itself."[37] Both Garland and Jerome assigned singers to three parts--low, medium, or high, according to whether their voices were of the chest, throat, or head. Through the sixteenth, seventeenth, and eighteenth centuries, the terms "chest," "throat," and "head registers" came into common use.[38] Even the great nineteenth-century teacher of singing, Garcia, believed that the human voice had three registers--chest, medium, and head.[39] Garcia first spoke of the three registers as "chest, falsetto, and head, in that order in both men's and women's voices."[40] However, in his last book, Hints on Singing, he renamed the woman's middle register and called it the "medium" register. He also referred to the intermediate adjustment in the male voice as darkening and mixing.[41] Garcia designated the "head" register primarily a soprano register, although he said it was possible for a few tenors to sing in this register.[42] What is considered a man's "head voice" today was thought of by Garcia as being his upper "chest voice sung with

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[36]"Quiz Cove," The Bulletin, XXI (December, 1964), p. 29, quoted in Philip A. Duey, Bel Canto in Its Golden Age, p. 33.

[37]Ibid.

[38]Ibid. [39]Ibid.

[40]Vennard, "A Message from the President," October, 1965, p. 21.

[41]"Quiz Cove," February, 1968, p. 34.

[42]Vennard, "A Message from the President," October, 1965, p. 33.

timbre sombre (that is, covered) rather than timbre claire [clear or uncovered]."[43]

There were a number of teachers and writers during the past two centuries who recognized only two registers--high and low. A fewer number have maintained that the voice has no registers at all, using the well-trained voice as an example of a voice without obvious breaks. Teachers have found that the untrained voice is not always so smooth and may have obvious breaks in the overall compass. Therefore, as far back as Mancini, teachers have felt the need to blend the registers so that the vocal scale is smooth in quality throughout the entire range of the voice. Moreover, by the end of the eighteenth century virtuosity reached such a high level of development that composers and singers demanded the exploitation of each vocal register.

Even though Appelman in 1967 still thought that the exact cause of registration in the singing voice was unknown,[44] many have tried to explain the causes. For instance, Garcia said:

> A register is a series of consecutive homogeneous sounds produced by one mechanism differing from another series of sounds equally homogeneous, produced by another mechanism, whatever modifications of timbre or strength they may offer. Each of the three registers has its own extent and sonority which vary according to the sex of the individual and the nature of the organ.[45]

In 1937, M. Nadoleczeny, M. and R. Zimmerman added to the existing information about how registration occurred:

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[43] Ibid.

[44] Appelman, The Science of Vocal Pedagogy, p. 86.

[45] Manuel Garcia, Hints on Singing (New York: Schubert and Co., 1894), p. 7.

> Each area of identical quality depends upon the adjustment of the resonating cavities. Registers are produced by a mechanism that functions in the production of sound. The principal characteristic of this mechanism is the manner in which a particular laryngeal vibration is coupled with the supraglottic (area above the vocal folds) and the infraglottic (area below the vocal folds) resonators.[46]

Recently a good deal has been learned about the subject of registration by the use of the stroboscope. In 1932, two French scientists, Husson and Tarneaud, used this method to study the action of the vocal cords. Later, the Bell Telephone Laboratories investigated the action of the vocal cords with a high speed motion picture camera operating at a rate of 4,000 frames per second.

Vennard, in collaboration with Van den Berg, reported scientific findings about laryngeal functions. Excised larynges were used to study and observe while they produced all the registration effects of the living voice. Vennard reports that abrupt changes in quality occurring as the student moves from one register to another are caused by improper or static adjustment of muscles which control the muscles of phonation. He describes what happens as one moves from one static adjustment to another: "When one's laryngeal function is so crude as always to be static, with breaks between different adjustments, we hear what we call 'registers.'"[47] Van den Berg reported that the increase in dynamics causes the tone to rise in pitch. Vennard explains, saying that an increase in dynamics will not necessarily cause sharping because the student learns to adjust his vocal mechanism

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[46]M. Nadoleczeny, M. and R. Zimmerman, "Categories et Registres de la Voice," Revue Francaise de Phoniatrie, (January, 1937), p. 24, quoted in Ralph Appelman's The Science of Vocal Pedagogy, p. 87.

[47]Vennard, Singing, the Mechanism and the Technic, p. 87.

by ear and his "laryngeal musculature will be conditioned to enable him to achieve greater loudness without sharping."[48] Vennard also says that vocalists have two extremes of vibration or registers. He upholds Garcia's philosophy by saying that the lower register covers the lower two-thirds of the compass and the higher register applies to the upper two-thirds with at least an octave in the middle which may be sung in either register. Vennard refers to the lower register as the "heavy mechanism" (chest) and the higher register as "light mechanism" (head). Vennard says that he prefers to think of the two extremes of registration as being dynamically related in order to minimize the possibility of making static adjustments every time the pitch changes.[49] Describing the heavy mechanism, Vennard says:

> The upper limit of this register is reached when the limit of muscular strength has been reached. Beginners who have discovered no other way to ascend the scale often "crack" . . . and an involuntary falsetto is heard.[50]

The light mechanism is experienced when the singer continues to sing past the point where the "crack" is experienced with a marked decrease in muscular effort in the vocal apparatus.[51] Even though Vennard advocates two registers, he says it is more realistic to consider the human voice as having three registers. Thus, the man has what is called "chest," "head," and "falsetto," whereas the woman has "chest," "middle," and "head" registers. He concedes that the two-register philosophy yields certain practical concepts such as the exercise of the "unused" register and the development of the "dynamic" adjustment.[52]

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[48] Ibid., p. 59. [49] Ibid., p. 66.

[50] Ibid., p. 67. [51] Ibid. [52] Ibid., p. 73.

Wilhelm Ruth summarizes the views concerning registers expressed by Nadoleczny in 1923 and Weiss in 1936. Nadoleczny said that registers were composed of "a series of successive matching vocal sounds which the musically trained ear can distinguish from an adjoining series."[53] The position of the larynx changes as the change from one register to another is made. Each register is created by a particular mechanism necessary for the production of sound.[54] Weiss gave a contrasting opinion about registers saying that the perfect well-trained singer knows no registers; but if breaks occur, they are caused by pathological influences such as sudden changes, tensions affecting the vocal cords, or "reactions of the resonating chambers."[55] He adds: "The physiological manner of the phonation makes these phenomena disappear."[56] Ruth was not satisfied with these explanations and sought more information concerning registers. He studied the larynx by means of tomography and the writings of Sonninen, Helsinski, and Frommhold. As a result of his study, Ruth states that if the larynx rises as the scale is ascended, it causes increased tension and definite register breaks. Conversely, if the larynx drops as the higher tones are approached, the student is able to sing an even scale.[57]

Vennard suggests that Husson's research adds light to the controversial problem of registration. Husson's explanation of how human beings change pitch with their vocal cords is that the chronaxy of the recurrent nerve is responsible for such changes. This theory is based

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[53]Wilhelm Ruth, "The Registers of the Singing Voice," The Bulletin, XIX (May, 1963), p. 2.

[54]Ibid., p. 3. [55]Ibid., p. 2. [56]Ibid. [57]Ibid., p. 3.

on the idea that a nerve fiber has a minimum period of time in which it can recover from a stimulation before it can be stimulated again, limiting the number of muscle contractions that are possible per second. "According to Husson, the chronaxy of the recurrent nerve is such that it can transmit frequencies up to about 500 influxes per second."[58] Vennard says that the limit of 500 influxes per second "becomes the top limit of the lowest register of the voice. Thus, a chest tone can be sung up to C_4 and not much higher by either man or woman."[59] In order for a singer to sing higher, it is necessary for each nerve, which is timed differently, to respond so that at least one-half of the nerves are operating for each vibration. This operation produces a softer and weaker tone.[60] Consequently, the registers are "related to chronaxy, rather than to sex, and hence they locate the register boundaries on a keyboard of absolute frequencies, rather than locating them relative to the individual voices."[61] Vennard maintains that the implications of Husson's research clearly upholds his theory about the necessity of changing to a lighter mechanism and enlarging the throat as one passes from the middle register to the higher register.[62]

Oncley says the "subject of registers finds a simple and logical explanation in the movement of certain harmonics into and out of these formant regions. These shifts may be readily heard with practice."[63] Therefore, since there are a number of formants which change

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[58]Vennard, "Some Implications of the Husson Research," p. 5.

[59]*Ibid*. [60]*Ibid*., p. 26. [61]*Ibid*. [62]*Ibid*.

[63]Oncley, "What Acoustics Means."

as the vowels are modified, the vowel formation has a great deal to do with the presence of definable registers.

More recently Appelman made a positive statement about the existence of registers, saying: "Registration is a physiological and acoustical fact."[64] He verified that all voices have three registers, using the research of Nadoleczeny, M. Zimmerman, and R. Zimmerman as proof of his statement. Van den Berg made a more comprehensive explanation of registers saying that vocal registration involves the adjustment of the larynx, flow of air, and the coupling of the larynx to itself. Equally important is the consideration of the longitudinal tension in the vocal ligaments and the "longitudinal tension in the vocal muscles [which] are important parameters determining the response in the main registers."[65] He adds that the "mid voice is not an independent register but a mixture of chest and falsetto register."[66] Although Taylor believes that register breaks may be caused by psychological reasons, he says register shifts are found where "each of the three controlling factors of the voice (thickness, length, and tension [of the vocal bands]) make significant shifts or combinations of interactivity."[67]

Falsetto Register

There were few who committed themselves before Fields' publication concerning the legitimacy or usefulness of the falsetto register

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[64]Appelman, The Science of Vocal Pedagogy, p. 86.

[65]Janwillem van den Berg, "Vocal Ligaments versus Registers," The Bulletin, XX (December, 1963), p. 31.

[66]Ibid., p. 18. [67]Taylor, Acoustics for the Singer, p. 33.

in cultivating a wider range. Since that time, contributors to The Bulletin have generally accepted the idea that the falsetto register is legitimate and useful in the development of a wider range. Perhaps little was said in Fields' book about falsetto because of the confusion and controversy concerning the subject. Confusion began with Garcia, who recognized the chest, falsetto, and head registers in the woman's voice.[68] This pronouncement meant that in most men's voices only the chest and falsetto registers were possible. Later, Stanley referred to the lower register as "chest," and the upper register as falsetto, but "made the unfortunate guess that the lower register should be called the cricothyroid register and falsetto, arytenoid register."[69] Clippinger recognized the chest, falsetto, and head registers in the male voice, referring to the head register as a "desirable intermediate adjustment."[70]

In 1929, Victor E. Negus advanced the theory that when the vocalis fibres contract, they make the vocal cords thin, producing the falsetto sound.[71] Negus' findings were interpreted to mean that an individual has a thick and thin adjustment of the vocal cords caused by the thyroarytenoid muscle. Furthermore, it was believed that a thick portion of the cords was used in the production of low and middle tones, calling for stronger muscles. Consequently, the thin cords, producing

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[68]Fields, Training the Singing Voice, p. 154.

[69]"Quiz Cove," February, 1968.

[70]Ibid.

[71]"Quiz Cove," The Bulletin, XXII (May, 1966), p. 40.

falsetto, called for a relaxation of muscles.[72] Wilcox, a follower of Stanley, introduced the terms "heavy" and "light mechanism."[73] These terms were closely associated with the idea of using a stronger musculature for lower and middle tones, and the relaxation of muscles for higher tones. Wilcox believed that the chest register relied upon an active function of the intrinsic muscles and the falsetto represented the complete surrender of the internal thyroarytenoids.[74]

Ross reports that falsetto occurs more noticeably in the high male voice but is not considered by many to be present in the female voice. Motion pictures of the action of the vocal cords by the Bell Telephone Company and another by Noel Pressman and Harry Hinman "advance the theory that there are at least two basic adjustments of the vocal cords, one--the natural or normal, and two--the falsetto."[75] In the Pressman-Hinman film, there is a "progressive approximation of the vocal cords from the front to the back of the larynx as the scale is ascended."[76] In the high singing range, or falsetto adjustment, there is a "dampening of the posterior or back end of the vocal cords, with a progressive single vibration moving from the back to the front of the larynx."[77] Thus, according to the report given by Ross, no distinction exists between the action of the vocal cords of a male or

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[72] Ibid., p. 41.

[73] John Wilcox, The Living Voice (New York: Carl Fischer, 1945).

[74] William Vennard, "Some Implications of the Sonninen Research," The Bulletin, XV (May, 1959), p. 10.

[75] W. Ross, "Falsetto," The Bulletin, V (January, 1949), p. 5.

[76] Ibid. [77] Ibid.

female--indicating that both sexes have a falsetto register. Ross claims two types of falsetto; the lip falsetto and pharynx falsetto. The pharynx falsetto may be experienced by opening the lips and mouth, allowing the pharynx to enunciate the vowel sounds. The pharyngeal enunciation "eliminates a large amount of the falseness, by establishing a stronger fundamental to balance the overtones."[78] Ross concludes that the falsetto quality should be predominantly a "pharyngeal-mouth resonance, but with a full sweep of nasal resonance."[79]

Even though Ross presented convincing evidence that there was no physiological difference between the high register of men or women, contributors to The Bulletin have for the most part discussed the methods of transition between the middle register and the high register separately for each sex. One of the popular methods of distinguishing falsetto from the man's head register had been accomplished by testing a tone to see if it could be swelled into full voice without a break in quality. If this technique could be accomplished, the tone was referred to as "head voice," but if the tone could not be swelled without a change in quality, it was called falsetto. It is reported that the vocal muscles are relatively relaxed in both head and falsetto register, but the latter seems "to be past the point of no return whereas the head voice seems to have a thread of chest voice in it."[80] The author of the preceding statement indicates that "such a tone is truly an intermediate adjustment to which the expression voix mixte is

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[78] Ibid. [79] Ibid.

[80] "Quiz Cove," The Bulletin, XXII (February, 1966), p. 34.

appropriate."[81] The range of the head register corresponds roughly to the overlap of the chest and the falsetto register. Even though there are few distinguishing factors between the head and falsetto registers, the falsetto requires more "breath for the same volume of sound."[82] Moreover, the head register is the most efficient adjustment possible since it normally can be sustained longer than any other tone.[83] Van den Berg summarizes his views about the falsetto voice saying that it is characterized by thin vocal folds, primarily passive longitudinal tensions in the vocal ligaments, little if any closure of the glottis, and a small number of partials.[84]

Several contributors to The Bulletin suggested the use of falsetto as an aid in developing a transition between the chest and upper register of the male voice. Vennard is one who says that when a student cannot change the quality or leave the compass of the range without a "break," it indicates that a static adjustment is present. A static adjustment to a bass means he also has a static falsetto, but if he develops a "dynamic" adjustment between the chest and falsetto registers, he is able to sing a smooth vocal quality from the chest register into an adjustment with a great deal of falsetto mixed in the tone.[85] Vennard also uses what he calls the "yawn-sigh" as a technique to incorporate both the chest and falsetto registers. This exercise

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[81] Ibid. [82] Ibid., p. 35. [83] Ibid.

[84] "Interdisciplinary Information," The Bulletin, XXVI (March, 1970), p. 43. A report by the NATS Interdisciplinary Committee citing a summary by van den Berg of his article, "Register Problems," Annals of the New York Academy of Sciences, CLV (November, 1968).

[85] Vennard, Singing, the Mechanism and the Technic, p. 76.

starts with a portamento from a high quasi-falsetto tone into a deep low chest tone to develop a smooth transition between the registers.[86] One writer says he has observed Ruth Chamlee uses the falsetto very effectively in the opposite direction. She uses a "series of ascending arpeggi in the falsetto sung on a pianissimo to make the singer aware that the upper notes could be sung softly with great freedom."[87]

Alfred Spouse is another who recommends the use of the falsetto to encourage the development of all tones above the middle range because its use allows the complete relaxation of the neck muscles and results "in a marked extension of the legitimate male voice into the higher register," eventually eliminating all signs of a break.[88] Another writer said that he found the falsetto as an aid in teaching students to use less effort in the throat as they sang in their upper range. He went on to say that if the falsetto is supported properly, it will develop into a pure head tone.[89]

Some deny that females have a falsetto register; others suggest that what is called the "whistle register" (above high C) is a female falsetto. One writer says there seems to be a difference in quality between the woman's "whistle register" and the head tones immediately

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[86] Ibid., p. 122.

[87] "Quiz Cove," The Bulletin, XXI (October, 1964), p. 30.

[88] Alfred Spouse, "Group Training," quoted in "The Story of the N.A.T.S. Seventh Annual Meeting, Chicago, Illinois," The Bulletin, VIII (January, 1952), p. 2.

[89] "Quiz Cove," October, 1964, p. 29.

below.[90] Another writer, answering a question regarding the possibility of whether the very weak tones in the middle of some women's voices were comparable to falsetto, said that he would not refer to these tones as falsetto because they occur at the transition points between registers.[91] Furthermore, the change in quality is caused "by trying to carry either the heavy or light voice quality into the other."[92] He maintains that the yodeling songs display what he calls falsetto.[93] Some of the contributors to The Bulletin did not make a distinction between the sexes concerning the falsetto register--the most notable being Vennard. He defines falsetto by saying it is the "lightest register, originally applied only to men's voices, but now also applied to women's."[94]

Blending the Registers

Fields defines "Blending the Registers" as a "process of fusing or merging two overlapping but dissimilar sections of the vocal range into a continuous whole."[95] Fields said that some believed these differences would not appear if the students were not aware of their existence.[96] This belief has been associated with the

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[90]"Quiz Cove," February, 1966.

[91]"Quiz Cove," October, 1964, p. 30.

[92]Ibid. [93]Ibid.

[94]Vennard, Singing, the Mechanism and the Technic, p. 251.

[95]Fields, Training the Singing Voice, p. 161.

[96]Ibid., p. 154.

Indirect Approach and referred to as the "idealistic or one-register" philosophy.[97] The goal of nearly every teacher is to produce a voice without "breaks" or inconsistencies in the vocal compass. Some teachers of singing who advocate the "idealistic philosophy" believe "the best way to make an ideal come true is simply to assume that it is true, and never admit anything to the contrary. They hold, as a principle of pedagogical psychology, that one should never suggest to a student the possibility that he might have a register problem."[98] The dominant personality of the teacher is the key in convincing the student of the validity of such an approach. The general teaching procedure for the cultivation of range usually begins with exercises using the middle range. The next step includes the slow expansion of the range, encouraging the student to "let go" or "give more support," but never mentioning the word "register" to the student. Some, however, instruct the women to color their lower range and the men to color their higher range.[99] The psychology of the approach is to assume that the student "somehow subconsciously makes the necessary adjustments and sings the high tone if he does not fear it."[100] Foote agrees with this philosophy, saying: "I believe we perform difficult technical feats in singing because we suddenly find we can--not because we suddenly know how."[101] His main point is based on the assumption that many teachers try to teach too much too fast and are not patient enough for nature and

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[97]Vennard, Singing, the Mechanism and the Technic, p. 69.

[98]Ibid. [99]Ibid. [100]Ibid.

[101]Foote, "New Horizons," p. 23.

maturity to be effective. Many agree with Foote, but the majority of contributors to The Bulletin also believe that specific instructions are often necessary to achieve the "one-register ideal."

It is reported that the early Italians used the messa di voce technique as a method of joining the registers.[102] The term messa di voce has been defined as a "classic Italian exercise consisting of a prolonged crescendo and decrescendo on a sustained tone."[103] By the consistent practice of this technique, the singer was expected to match both quality and intensity of each register at the transition points until the "break" between the registers disappeared.[104] Hence, the purpose of blending the registers is to eliminate all "cracks," "breaks," or differences of quality from the vocal compass, creating a uniform and even scale. Adjustments are necessary as an individual sings from one note to another and many believe that the muscles which are responsible for making the adjustments for speech sounds are naturally stronger than the muscles used for the "unused" registers. Therefore, the first consideration in blending the registers should be the strengthening of the unused muscles. The stronger muscles are associated with the production of the "heavy mechanism" and the weaker muscles are associated with the production of the "light mechanism." Vennard suggests that in order to develop the widest range without a

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[102]Cornelius Reid, Bel Canto, Principles and Practices (New York: Coleman Ross Co., 1950), p. 88.

[103]Vennard, Singing, the Mechanism and the Technic, p. 261.

[104]Reid, Bel Canto, Principles and Practices.

break, the adjustments must be heavy in the lower part of the voice, and a balance between the adjustments permits a smooth shift from one register to the other. Furthermore, softer singing requires a lighter production.[105]

During the first part of the period covered in this study, a few contributors to The Bulletin suggested that the blending of the middle range should be considered first before the high and low registers. For instance, Gardini said that the teacher should deal with the mastery of the middle and lower transition points first because the entire range depends upon their correct emission and control.[106] William E. Jones suggested that the extremities of the range are dependent upon the "intense yet restrained use of the medium tones," and recommended a mixture of production to keep the middle voice "intense and heady."[107]

The significant principle of "overlapping" is also important in the discussion of blending the registers. Garcia showed that more than one octave could be sung in either registration and stated that the "transition from one to the other could be made on different pitches by the same voice at different times for differing artistic purposes."[108] Thus, the concept was advanced that the transition

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[105]Vennard, Singing, the Mechanism and the Technic, p. 77.

[106]Gardini, "Voice Foundation."

[107]W. E. Jones, "Leaves from my Notebook," The Bulletin, III (June, 1947), p. 3.

[108]Vennard, "A Message from the President," October, 1965, p. 33.

points do not have to be at the same pitch but as the singer wishes. This concept is often true, depending upon the individual, but whether the transition point is at a particular level or not is not as important as the achievement of a smooth vocal sound throughout the range.

Approaching the High Register

Some teachers, starting with Witherspoon, instruct their students to give a "lift of the breath" at the transition points between registers. The singer at the same time should change to a lighter production, causing less intensity, and use an extra amount of breath at the transition points. The extra breath will keep the volume from dropping and help the quality to remain constant. The "lift" at the transition point becomes less noticeable if the student will lighten the production gradually as he ascends the scale.[109] The term passaggio has been a popular term used in the past to refer to the transition point between the registers. Weldon Whitlock continues to use the term passaggio, as well as synonyms such as turning and bridging, to explain the process of avoiding a "break" in the vocal line as the student approaches his upper register.[110]

Many singers notice a transition point between particular pitches. The tenor, for instance, may feel a need to make a transition from the chest register to the falsetto register between "F sharp" and "G" above "middle C." The soprano many times has a similar

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[109] Vennard, Singing, the Mechanism and the Technic, p. 77.

[110] Weldon Whitlock, "The Problem of the Passaggio," The Bulletin, XXIV (February, 1968), p. 10.

"lift" point between the same two pitches an octave higher. It is not advisable to require a beginning student to look for trouble between these two tones because he is likely to approach these pitches with apprehension. Later in his study it would be a good idea to discuss the matter with the student to give him a fuller understanding of the vocal instrument.

A direct method of approaching the high register is given by Ramon Unruh, who uses the [u] vowel to mix the head and falsetto register. He also uses short scales employing the [hŋ] sound to crescendo into the open [ɑ] which helps to achieve a desirable quality in the upper range.[111] This method is especially helpful as a device to create more room in the back of the throat and get the student to experience the sensation of sound in the whole mouth. Such a production should result in a sound which is described as a "mixed" quality.

The Indirect Approach of using terms such as "let go" as the singer is approaching the upper range is explained in two different articles in The Bulletin. The first article, by Vennard, who interpreted the published research of Aatto A. Sonninen, discussed the role of the external laryngeal muscles in the length-adjustment of the vocal cords in singing. Vennard said that if we consider the voice as having three registers, the chest register is sung with the unaided cricothyroid muscles, the middle register is produced by the extrinsic muscles which are helped by the intrinsic muscles, and the head register

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[111] M. H. Kelton, "Chapter Notes--Nashville Area," The Bulletin, XVI (February, 1960), p. 16.

is produced by the stretching process of the extrinsic muscles with a maximum elongation of the cords.[112] Explaining, he says: "As singers, we know that something 'lets go' as the 'head' voice is entered. Some of the 'letting go' is also in the cords themselves."[113]

A second article is by a member of the Committee on Vocal Education, who answers the question of what the term "let go" actually means. He answers saying that singers often work too hard to produce high tones; consequently, "they should 'let go' progressively as the scale is ascended, unless great power is desired in the tone."[114] According to the scientific opinions expressed in 1960 by Sonninen, van den Berg, and Faaborg-Andersen, the falsetto adjustment (internal thyroarytenoid muscle) is believed to be passive or has "let go" completely. Therefore, "let go" means "Release throat muscles and use more breath and more faith instead. Singing in falsetto will give a man a clear idea of what 'let go' should mean."[115]

A combination of the Indirect and Direct Approaches in blending the middle and upper register is given by Gould, who says: "There is a definite relation between the position and action of the tongue and the position of the larynx in phonation."[116] He advises that the

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[112] Vennard, "Some Implications of the Sonninen Research."

[113] Ibid.

[114] "Quiz Cove," The Bulletin, XVII (October, 1960), p. 32.

[115] Ibid.

[116] Gould, "Phonation," p. 6.

"flattened tongue and the larynx at its level when in repose, resulting normally from correct inhalation, must be retained not only at the impulse of the tone but at all times and in all pitches."[117] Even though the preceding instruction is primarily direct in nature, there is an element of indirect activity suggested in the statement referring to the larynx in repose.

Another reference to a combination of approaches is suggested in an answer to a question asking what procedures should be used in teaching a student who has a definite "break" between the upper and lower registers. The first part of the answer is direct in nature, suggesting that the break between registers is accentuated by heavy singing and minimized by light vocalizing. The second part of the answer is indirect stating that when the light exercises have produced an equal scale it is possible to "strengthen the middle area by imagining that he is singing an octave higher and an octave lower at the same time."[118] He continues by saying that this kind of imagery helps to "activate both parts of the voice into the response known as the 'mixed' register and should eventually eliminate the break."[119]

Whitlock indicates a preference for a combination of approaches by giving both direct and indirect instructions concerning the subject of blending the registers as the high register is approached. The direct instruction is given when he says: "There must be a note-by-note

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[117] Ibid.

[118] "Quiz Cove," The Bulletin, XXII (May, 1966), p. 43.

[119] Ibid.

adjustment in singing up the scale, or there is no turning into the upper register."[120] Consequently, as the scale is ascended, each tone takes more of the characteristics of the upper register and fewer of the lower register. The reverse is true when one descends the scale. If this note-by-note adjustment is not made as an individual ascends the scale, "tension builds up to the point where it is impossible to turn at all."[121] Whitlock gives indirect instruction when referring to the importance of retaining the "point" of the tone as the upper register is approached. The term "point" is considered as being indirect in nature because methods used to acquire this goal are usually very subjective.

Vennard advocates the use of a combination of approaches to achieve a smooth vocal line throughout the vocal range. A necessary technique in attaining the smooth vocal line is the maintenance of a low, free larynx as the student approaches the high register. The lowering of the larynx is an indirect method of achieving freedom because Schilling and Sonninen have proved that when the larynx is lowered, "it releases extrinsic tension."[122] Giving more direct instruction, Vennard endorses what Sonninen had to say about finding the correct position of the head, neck, and larynx as the high range is explored. X-ray studies of professional singers show the head tipped forward, the jaw dropped, and the body more erect for the

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[120]Whitlock, "The Problem of the Passaggio."

[121]Ibid.

[122]Vennard, Singing, the Mechanism and the Technic.

production of high tones.[123] Even though these movements are usually accomplished by direct means, some teachers prefer an Indirect Approach achieved by the "whispering position."[124]

Cover

The term cover has become quite controversial in its usage with its meaning surrounded by a great deal of confusion. The first to use the term cover were Diday and Petrequin in 1840, who used the word to describe the technique of maintaining a low position of the larynx, instead of allowing it to rise as the pitch ascended.[125] Cover was used for a period of time to indicate a method of bridging the middle and upper registers. This method supported the concept of lowering the larynx to produce a darker quality as the high register was approached. Garcia believed that the voice had two timbres--light and dark. He said that when the dark timbre is exaggerated the voice is covered, choked, or muffled; however, "from E_4 on up to B_4 both men and women can carry up the chest voice in timbre sombre creating an illusion that they are not covered."[126] Garcia referred to such tones as voix mixte. Marchesi, Garcia's pupil, continued to use the same terminology, "making 'covering' and 'mixing' synonymous."[127]

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[123] Ibid., p. 11.

[124] Ibid., p. 12.

[125] Vennard, Singing, the Mechanism and the Technic, p. 151.

[126] Ibid., p. 153.

[127] Ibid.

Confusion concerning the term cover began as some started using the word without reference to pitch. Consequently, advocates of "covering" often suggested darkening the complete range and not just the upper range. As a result, the misinterpretation of cover caused many to abandon its usage completely. Some have continued to use the word cover to refer to the technique of bridging the middle and upper registers. The technique has been quite useful in keeping singers from singing "wide open" or "yelling" in the upper range. A common method of teaching men the technique of "covering" is through the use of the modified [u] vowel as the upper register is approached. After the modified [u] vowel has been successfully mastered, it is then used in alternation with all other vowels in order to guide the student to match the quality of individual vowels with the quality of the modified [u] vowel. The Direct Approach is used in the preceding instructions by suggesting not only the vowels but how they should be used. The Indirect Approach is also used in the process of matching the vowel sounds.

The main physiological changes which accompany a "covered" tone are the low larynx and the high uvula. Making these physical changes by conscious manipulations is referred to as the Direct Approach, which has been condemned by many because it often creates excessive tension. The indirect method of suggesting the "beginning of a yawn" is an effective device for achieving the low larynx and high uvula without excessive tension. The use of the round vowels, especially the [u], also promotes an indirect way of achieving the desired physical adjustments for the high range. The familiar exercise of beginning

with the [a] vowel "at the bottom of the scale and shifting to [ɔ], [o], or even [u] for the top" has been used for a long time to teach students how to "cover" the tones in the high range.[128] Vennard suggests an indirect method of teaching "covering" by telling the student to "sing it like a falsetto, but not quite. . . .The tone must feel like falsetto, but have just enough 'edge' or 'focus' so that it can crescendo to a full-throated tone without a break."[129]

A direct method of blending the upper quality with middle quality is also recommended by Vennard. He suggests singing a three-tone scale loudly in the lower register, followed by a portamento to a pianissimo head tone an octave higher. From the pianissimo head tone, the singer should crescendo as he returns to the heavy registration at the bottom of the scale.[130] It is important to get a bright forward tone and the student may get this sensation by placing "the high head tone where he felt the [u]."[131] Most of the instruction in the previous statements have been direct in nature, but the last statement concerning the placement of the tone is definitely indirect. Vennard says that the expression "cover" is born of old-fashioned concepts and he personally hesitates to use the term because it often leads to a throaty production.[132] Although Vennard uses some of the instruction normally associated with the term "cover," he prefers the term "focus" instead.

One of the members of the Committee on Vocal Education, in advising a person how to avoid constriction in the throat using the

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[128] Ibid., p. 154. [129] Ibid. [130] Ibid., p. 155. [131] Ibid.

[132] Ibid.

"cover" technique, suggests the student experience a feeling of upper roominess as he sings higher.[133] To achieve this condition, the student should think of unhinging the jaw from ear to ear and inhale so that the breath seems to strike the roof of the mouth before it enters the lungs. The act of inhalation makes the uvula and soft palate automatically rise and the larynx lowers in preparation for the high tones.[134] There should be no tension beyond the normal tension required to keep the throat in the same position created by inhalation. The lowered larynx and raised uvula also prepares the right cavity to receive and augment a desired quality. Both indirect and direct instructions are useful in securing the desired results.

Husson uses the term tubing to refer to the act of "covering" the tone. Tubing is defined as a "postural modification of the muscles which define the labial aperture; the lips are projected forward, and the area of this aperture is reduced."[135] The physical changes which take place as a result of "tubing" includes the protrusion of the lips, a slight lowering of the larynx, an expansion of the laryngopharynx, and a movement of the tongue position. Tubing also changes all open vowels to darker and more closed vowels. In experiments, Husson found that as the student experiences a reduction of reverberation in the room, he automatically tries to compensate by "tubing."[136] It was also

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[133]"Quiz Cove," October, 1960, p. 33.

[134]Ibid.

[135]Husson, "How the Acoustics," p. 13.

[136]Ibid.

found that excessive tubing causes vocal fatigue and distorts the vowels to a great extent. These factors are especially noticeable when a singer attempts to sing in the open air or in a soundproof room.[137] Husson indicates a partial solution to the problem by implying that this information could serve as a warning to expect excessive tubing or covering in a room with low reverberation. Thus, the singer should guard against oversinging by seeking the most relaxed and easy production he can achieve. It would also be advisable to sing with the brightest tone possible and be satisfied with less reverberation than can be expected under normal conditions.

An experiment showing the necessity of "covering" or modifying the vowels to sing an even scale was made in 1965. The experiment was restricted to male singers and the results showed that all of the singers made significant changes in formant frequencies and vowel modifications at the point of register change while singing from the low to the high register of the voice. There was a noticeable tendency for the "vowels to modify toward a more closed or tense sound during the transition into the upper register of the voice."[138] It was noted by a comparison of the average formant frequencies "that the tenor vowels were usually more open or brighter than the corresponding baritone vowels."[139] The study also showed that "the average transition

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[137] Ibid., p. 17.

[138] Merle E. Taff, "An Acoustic Study of Vowel Modification and Register Transition in the Male Singing Voice," The Bulletin, XXII (December, 1965), p. 11.

[139] Ibid.

point for the tenor voices was approximately a minor third higher than that for the baritone voices,"[140] and the transition point for both voice types was slightly lower for the closed vowels than for the more open vowels.[141]

Blending Women's Registers

The majority of the views expressed in The Bulletin agreed that the same vocal procedures should be used for all voices; but there were some who qualified their remarks with exceptions regarding women's registers. For instance, Vennard makes the statement that "all voices should be trained alike, if possible,"[142] but in the next paragraph he gives special instructions for the vocal problems of the high soprano.[143] He suggests that students in general should not allow high notes to merge into one neutral vowel, but an exception must be made for the high soprano because it is impossible for her to produce the overtones in the high range which create recognizable vowels.[144] Therefore, the high soprano should modify the vowel toward a neutral sound because that is the only sound she can make without constriction.[145]

While the "unused" register for the male voice is the falsetto, the "unused" register for the female voice is the chest register. With the exception of the contralto, the majority of women completely avoid the chest register because the quality is often regarded as being

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[140] Ibid. [141] Ibid., p. 35.

[142] Vennard, Singing, the Mechanism and the Technic, p. 158.

[143] Ibid.

[144] Ibid., p. 159. [145] Ibid.

masculine in sound. Thus, it is advisable to assign vocal exercises which use the woman's chest register in order to overcome the hesitancy to mix this register with the lighter mechanism. The use of downward vocal exercises has proven to be a most successful method of overcoming the "contralto break." The area of overlap between the registers should be used as a base of operation with excursions downward through the transition point. The student should attempt to match the registers by lightening both the quality and production of the chest register. A direct method of curing the "contralto break" was given by a member of the Committee on Vocal Education who said that one should remove the pressure at the back of the tongue by increasing the room in the back of the mouth.[146] The jaw should be loose, the tongue forward and flat so that the throat has width and freedom. Use the (ɑ) vowel with a two, three, and five-tone scale; match the tones, making sure that the jaw is free and the tone stable and bright.[147] Appelman suggests that the female singer avoid abrupt changes in quality by approaching the lower register with less energy, easing her voice into the lower mechanism.[148] Whitlock also believes the descending scale should be used because "it is much easier to go from the upper register to the lower than the other way around."[149]

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[146]"Quiz Cove," The Bulletin, XIX (December, 1962), p. 22.

[147]Ibid.

[148]Appelman, The Science of Vocal Pedagogy, p. 93.

[149]Whitlock, "The Problem of the Passaggio," p. 12.

Appelman says the contralto voice has a transition point between the pitches of "D" and "middle C" or "middle C" and "B." The soprano or mezzo-soprano has a transition point between "E flat" above "middle C" to "D" or "D" to "middle C."[150] Another frequent transition point for the female is experienced when she approaches the higher range. Taylor believes that "no physiological or acoustical reason [exists] why co-adjustment of the cords and cavities should be more difficult one place than another except, perhaps, in terms of the adjustment mechanism, but not in terms of pitches in given voices."[151] Appelman maintains that the chest voice is a necessary part of the female's vocal range, reaffirming Garcia's theory that all voices have three registers.[152] For the woman, the registers are identified as the "chest," "middle," and "head" registers. The woman is advised that the higher the chest quality is carried, "the more difficult and obvious the transition becomes."[153]

Whitlock suggests an exercise for the soprano who needs to eliminate the "break" between the middle and high register. The exercise begins with a five-tone staccato scale in the low range, followed by the same thing an octave higher. The last tone is sustained for a moment before the scale is descended slowly, maintaining extreme

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[150]Appelman, The Science of Vocal Pedagogy, p. 91.

[151]Taylor, Acoustics for the Singer, p. 33.

[152]Appelman, The Science of Vocal Pedagogy, p. 93.

[153]Ibid.

legato.[154] Whitlock maintains that just getting the jaw tension relieved will often "do the turning for the soprano."[155] He also advises both male and female students to match intensity and quality of the registers by using brighter vowels to bridge the transition points.[156]

Conclusion

"Modulation" rather than "Range" serves as a more accurate heading for the presentation of contrasts and changes related to pitch, classification, compass, and registers of the voice. The majority of teachers of singing at the time of Fields' publication defined the process of changing pitch as the change from one frequency to another. Today, changes of pitch for the singer is thought of as a psycho-physiological process dependent not only on frequency, quality, and intensity, but upon the individual's ability to interpret what he hears.

The advances of science have also made it possible to dispel some of the old-fashioned ideas about the classification of voice types within the singing range. For instance, the idea that the voice type depended upon the length of the vocal cords or the physical characteristics of the singer has been proved as an unreliable guide. Even the information given by scientists such as Husson was not immune to contradiction by another scientist. In addition to contradicting Husson's claims about the excitability of the recurrent nerve causing

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[154] Whitlock, "The Problem of the Passaggio."

[155] Ibid. [156] Ibid.

the various vocal classifications, Landeau gave a timely warning to teachers of singing about exploiting theories before they have been proved. Teachers of singing are notorious for accepting scientific theories as facts. Many will take great liberties with such theories, using them to build a pseudo-scientific basis for their own private methods or philosophy. It is logical to assume that there are two ways of classifying the human voice, either by the "empirical" or "scientific" method. It is important to remember that some voices will not fit into a particular vocal classification and others may change from one classification to another--especially during the first years of study. After the voice has matured with training and exercise, it can be classified more accurately; but until that time, the student and teacher should beware of classifying voices too quickly or in a "set" classification.

The main discussion concerning the cultivation of the vocal range centered on the topic of "registers." Although the concept of achieving a "one-register voice" is an ideal which every teacher strives to accomplish, the three-register concept originated in the thirteenth century and has persisted to this day. Garcia reaffirmed this theory during the nineteenth century, and he has been used as an authority by many twentieth-century teachers. Along with the three-register concept has been a general recognition of the two extremes of high and low tones. Later, these extreme portions of the voice were labeled as the "two-register" concept, which had an octave between the extremes called the "overlap." The two-register concept was not formalized into any well-defined philosophy until about 1930, when scientists began to explain

registration in terms of the adjustments of the vocal mechanism. From this beginning, the idea that the voice contained two extreme adjustments led Wilcox to label the lower register "heavy mechanism" and the higher register "light mechanism." Vennard continued to use the same expression and said that the registers overlap by an octave which could be sung with either mechanism. Even though Vennard says the three-register concept is more realistic, he prefers the concept of two registers because it promotes the idea of the "unused registers" and gives a basis for the philosophy of a "dynamic" adjustment. The concept of a "dynamic" adjustment makes it possible to move through the registers without a change in quality. Vennard's contributions to vocal pedagogy have generally been accepted as being valid and reliable.

Scientists have explained what caused the various registers in the human voice with what at first might be considered conflicting conclusions. For example, there are scientists who say the muscles surrounding the vocal area cause registers. Others have said that registers are a result of acoustical factors, neurological processes, and/or psychological factors. However, it is possible that all of the scientists are right. It is not unreasonable to assume that registers could be caused by muscular imbalance, faulty coupling of the resonating chambers, a fixed neurological process, and/or psychological factors. The acceptance of this possibility would make it necessary for the teacher to check each area for faulty production before the registers could be blended successfully.

If we accept the idea that registers are caused by a muscular imbalance, Vennard's method of dynamic adjustment has been tried and

proved to be a successful means of achieving control of the muscles. This method also includes the idea of strengthening the "unused" registers and merging in and out of registers, using caution until the registers can be approached without abrupt readjustments. The significant principle of "overlapping," first enunciated by Garcia, is also important in achieving a dynamic adjustment throughout the range. If the teacher thinks of the registers resulting from acoustical factors, the preparation and coupling of resonating chambers are important to the received sound because the condition of the walls or the coupling of the cavities either augment or damp the sound. If the teacher accepts the idea that registers are caused by neurological factors, the same problems of blending the registers needs consideration. If psychological factors are responsible for registers, psychologists have proved that desired physical responses can often be made just by the mental processes. Thus, the correction of register difficulties could be accomplished by the same means which caused them.

Today, the process of blending the registers includes a mixture of old and new concepts. For instance, the old term, passaggio, is used occasionally for what many call "bridging" or connecting the registers. Although messa di voce is another term seldom used, the method is still used by some to bridge the registers. Garcia fixed the transition of the registers at definite points, but this concept was rejected by many for the first half of the century. The theory has been revived again and is supported by such men as Vennard and Appelman. Some say that they cannot accept the theory that transition points are "fixed" between the same two notes for every singer because experience

has proved that this is not always true. These say that if the theory of the "fixed" transition points is meant to apply to the average or normal pitches where the transition occurs, it is acceptable.

The closed vowels have been used successfully in mixing or blending the male's middle register with the upper register. The [ʌ] vowel, in descending scales, has proven to be one of the most successful vowels used to blend the same registers for the female voice. The mixing of the qualities and physical adjustments of each register is also recognized as a valid approach to blending the registers. The blending of the registers is often aided by explaining the "lift" of the voice to the student. The "lift" may be accomplished by the direct method of giving more breath at the point of transition, relying on the body for support, and creating room in the back of the throat. To combat the possibility of creating excessive tension, it is sometimes helpful to instruct the student to "let go" as the scale is ascended. The indirect instruction of "let go" has much more meaning if explained in terms of letting the throat muscles relax and approaching the higher register with less force. The explanation is an important aid because the suggestive power of the phrases may awaken the mind to make the necessary adjustments.

The positions of the tongue and larynx are also important in achieving a smooth transition between the registers, but the voluntary manipulation of any part of the body must be matched with a degree of freedom and relaxation, or else coordination is impossible. Scientific investigation and practical experience have established the concept that when the high register is approached, the larynx should be kept

low and the throat open. A favored method of attaining this ideal is by securing the beginning of a yawn. However, the beginner often has difficulty in achieving the beginning of a yawn without creating rigidity at the same time. Therefore, the teacher is faced with the task of securing the open throat without rigidity. Indirect methods using imagery are often helpful in acquiring the desired balance. Thus, blending the registers indicates a student must develop a balance of muscular strength and freedom in the "unused" registers, match the intensity and quality of each register, use the correct vowels, and couple the resonating cavities correctly by adjusting the cavities through tongue placement or changing the size of one or more of his cavities. All of these techniques are accomplished by indirect, direct, or a combination of both methods.

There were not many who would commit themselves concerning the subject of falsetto and chest registers during the fifteen-year period prior to Fields' publication. Perhaps there was so much confusion and controversy about these registers that few knew what to say. Since that time a number have supported the idea that the falsetto register and chest registers should be strengthened and used as a part of the individual's range. Scientific investigation has shown that the vocal mechanism producing the falsetto in the male voice is just like the vocal operation of the upper female range, indicating that both men's and women's upper ranges should be called falsetto. Nevertheless, the majority of teachers still refer to the falsetto as the upper male register and the head voice as the upper female register.

The term cover has been discarded by many because its meaning has been clouded by conflicting definitions. The confusion began when some interpreted the word to mean a darkening of the whole vocal range, instead of just the upper range. Other terms have been discarded because their meanings have been misunderstood and new terms are used in their place. Since nearly every term needs to be explained to a beginning student, it would be wise to familiarize the student with all the synonyms which have been used in the past to help eliminate confusion in the vocal profession.

Although many basic vocal techniques are applicable to all students, some techniques help men to blend their middle register with the falsetto register while others are useful in blending the female registers. Therefore, teaching voice effectively depends upon the use of many similar techniques and specific techniques which are especially designated for a particular individual. It is important to realize that both indirect and direct instructions are needed to teach students how to cultivate the whole vocal range without obvious "breaks" between the registers.

CHAPTER VII

SUMMARY, INTERPRETATION OF FINDINGS, AND RECOMMENDATIONS FOR FURTHER STUDY

This study has presented contrasts and changes in the methods of teaching techniques of singing through the processes of respiration, phonation, resonation, and modulation since the 1940's. It has also shown a decline of the exclusive use of either Direct or Indirect Approaches with a growing preference for methods embracing both approaches. Hopefully teachers steeped in the traditions of the past have become aware of recent changes in vocal pedagogy, and those trained more recently have been informed of the teachings of the past. Such knowledge should result in more understanding and respect among previously antagonistic teachers.

Training the Singing Voice by Fields was selected as a basic reference for this study because the contents present a synthesis of pedagogical thought prior to its publication in 1947. Fields mentioned that his investigation indicated a need for further scientific clarification and organization of methods and concepts concerning vocal procedures. He also said there was a great need for clarification and standardization of terminology as well as more research concerning vocal theories and procedures. At the time of Fields' publication there were so many unanswered questions about vocal matters that he listed

ninety-seven research problems which needed attention. At that time the NATS organization was still in its infancy and therefore not mature enough to deal with problems effectively. However, NATS grew quickly in size and importance to become one of the most influential organizations of its kind in the world. As a result, the NATS publication, The Bulletin, exists as a representative body of writings by singers and researchers since Fields' publication.

Until recently the methodology of vocal pedagogy was primarily represented by two opposing approaches--the Indirect and Direct. One of these two approaches was advocated by many vocal teachers who had the idea that the opposing approach was either destructive or ineffective. Even in 1947, Fields divided the topic of "Methodological Considerations" in his book into two main divisions: the "Psychological Approach" (Indirect) and the "Technical Approach" (Direct). Those who favored the Indirect Approach taught the methods of singing using such terms as "naturalness," "feel," "subconscious," "spontaneous," "involuntary," and "automatic reflex actions." They trained the voice largely through common experiences intended to instruct without conscious or voluntary controls. Procedures using "imagery," "figures of speech," and the "right mental concept" were frequently associated with the teaching methods of the Indirect Approach. Those who favored the Direct Approach to teaching singing spoke of the techniques in terms of "controls," "management," and "deliberate physiological changes." One who taught by this approach emphasized the conscious manipulation and control of the processes and techniques involved in the vocal act.

The Indirect Approach had its roots in the "Golden Age of Singing," and adherents to this approach claim that the "secrets" of that day have been passed down to this generation by students and followers of the great singers and teachers of that period. Others list the basic skills of the bel canto school and indicate that these rules are as effective today as they were then. The Direct Approach had its roots in the nineteenth century concurrently with increased emphasis and knowledge brought about by scientific study in many areas, including that of the vocal apparatus. Important scientific findings were reported by such men as Helmholtz, Willis, Wheatstone, Hermann, and Scripture. The scientific approach was interpreted and advanced in the twentieth century by such teachers of singing as Shakespeare, Marafioti, Proschowsky, Stanley, and Wilcox.

Since the consequences of techniques taught by one method were feared by teachers of the opposing method, the controversy over which approach should be used raged for nearly fifty years. Misunderstanding and diversity of opinion was due in part to the number of specific teaching procedures developed by individual teachers without an understanding of the basic underlying pedagogical principles. Also, the tendency for teachers to guard their "secrets" against either the possibility of refutation or adoption by a rival teacher contributed to the lack of agreement among teachers.

Important influences which brought about action and progress toward the partial elimination of misunderstanding among members of the vocal profession were books such as Training the Singing Voice by V. A. Fields, and Singing, the Mechanism and the Technic by William Vennard.

A more important influence may be attributed to NATS. In 1948, NATS published an important report called "Basic Fundamental Requirements for Teachers of Singing." This report was designed to set standards and improve the quality and prestige of the teacher of singing by suggesting special courses for the training of prospective teachers. The suggested topics in this curriculum were often taught by recognized authorities at the various chapter meetings and workshops sponsored by NATS. Many of these lectures were printed in The Bulletin and were designed to eliminate the insufficiency and inconsistency of vocal teaching procedures. By inviting competent men from the fields of medicine, psychology, and science to discuss the related matters of physiology, the will, and the properties of sound, the NATS organization became the guiding force which has brought about the clarification of concepts and charted a pedagogical course in the field of singing.

Another contributing factor which caused many to accept the validity of both the Indirect and Direct Approach was the creation of opportunities for dialogue between teachers of both approaches by the NATS organization. Through the dialogue and articles in The Bulletin, it became apparent that there were substantial areas of agreement between the two schools of thought. It was soon evident that effective teachers used a combination of both the indirect and direct methods as the situation demanded. Probably no teacher totally neglected either approach which is an indication that the psychological and scientific methods complemented each other. It is therefore important to understand how the validity of each approach came to be accepted in the

various methodologies connected with the individual techniques of respiration, phonation, resonation, and modulation.

The acceptance of the concept that either or both approaches could be used in teaching the methodology of breathing as well as other techniques did not happen all at once. Fields showed that a majority of opinions expressed prior to his publication favored the Direct Approach in teaching "posture," "control of the organs of breathing," and "diaphragmatic controls." Contributors to The Bulletin also generally agreed that the Direct Approach was preferred in achieving correct posture, but the control of the organs and the diaphragm were taught by both direct and indirect methods. Contrasts were evident as a few insisted upon a strict interpretation of their respective approaches. For instance, some interpreted the technique of correct breathing as being a totally "natural" response, a spontaneous activity without any attempt at voluntary controls. A few also insisted upon a totally Direct Approach to correcting posture, insisting upon the voluntary and immediate correction of any fault. Other teachers after hearing both sides began to realize that even the most indirect or direct admonitions were not always consistent. Closer examination revealed that the "indirect teacher" did use some direct instructions and the "direct teacher" also used some indirect instructions. Sometimes, in the case of methods used to give support to the breath, it was a clarification of terminology and interpretation of physiological factors which led to a realization by members of both approaches that muscular coordination coupled with freedom was necessary to achieve proper action of muscles responsible for the support of

breath. The diaphragm is now recognized by many as a voluntary muscle which is controlled indirectly by other muscles. Also, instead of relegating the total responsibility of breath support upon the costal or abdominal muscles, more efficiency is acquired if the singer relies upon the coordinated effort of all the body muscles.

The subject dealing with methods of breathing was one of the main topics for teachers of the bel canto period. Breathing continues to be discussed today in the beginning stages of vocal training with a great emphasis upon posture and the mechanics of breathing. It is held that many beginners need not only to increase breath capacity, but to learn the techniques of controlling the breath because the vocal act is dependent upon air to create sound. A majority of views indicate that although breathing is a natural act, singing demands more air than necessary to sustain life. Some believe that breathing exercises which are separated from the singing act itself do little good under normal circumstances, but the conscious alternation of slow and fast inhalation, filling the lungs to capacity with special emphasis upon filling the lower part of the lungs, is necessary with most beginners because they do not use more than a small portion of lung capacity in normal breathing. Sometimes conscientious students of singing will carry out instructions to breathe more deeply than is good for them. In such cases teachers are advised to warn them that overbreathing may cause as many problems as underbreathing.

Capacity and power to control the breath are not achieved or learned immediately; they are considered as growth processes which should be checked closely by the teacher throughout the student's

instructional period. Direct instruction is often thought necessary to teach breath control, but should be followed by indirect instructions to divert the student's attention from the breathing process after a certain amount of proficiency is gained. One of the most popular methods of diverting the student's attention from the physical processes of breathing is to have him concentrate on the interpretation of songs.

Correct breathing is especially dependent upon correct posture. Most instructions dealing with posture are direct in nature because many believe that the individual has conscious control over muscles responsible for correct posture. The object of having good posture is obvious from the standpoint of being for the best welfare of the individual, but its importance in singing is often discussed as a necessary factor for efficient singing. Views indicate that correct posture includes the concept of having the bones and muscles in a favorable position to create a body balance which is conducive to coordinated actions. The body should be erect, having a comfortably high chest, upright spine, and moderately low shoulders with the head balanced and free. The feet should be slightly apart with the weight of the body on the forward foot. Although this is a general description of correct posture, individual differences provide exceptions to the rule. It is reasonable to assume that it would be a mistake to force a person to conform to a standardized position of the body if it caused unfavorable tensions and hardships.

Coordination has been an important factor in cultivating breath control by providing the proper conditions for the achievement of correct

posture, breathing habits, and support. Coordination is described as a balanced effort of the will, nerves, and muscles; achieved by direct instruction, using imagery and diversion to relieve excessive tension.

Fields reflects the prevailing opinion of teachers of singing prior to 1947, saying that phonation is so integrated with the other body functions that no part of the study can be considered independently; therefore, the first topic he discusses is "Total Coordination." The term "Total Coordination" had not been defined properly at the time of Fields' publication because his conclusion concerning phonation admonished against the Direct Approach, since this approach favored "attention-arresting admonitions" which disturbed spontaneous vocal coordinations. In the process of learning, the correct action necessary for phonation often results in too much muscular effort which leads to excessive tension. Since the student is often under pressure to try to accomplish something which he does not fully understand, he may produce unnatural and forceful sounds. A number of writers agree that one of the first responsibilities of the teacher of singing is to get the singing mechanism to operate as freely as possible. It is recognized that what is habitual for a student is not always desirable. In such a case, the student is advised to learn what is desirable and try to produce the correct sound with the minimum of effort.

One of the indirect terms often used to combat excessive tension in the process of phonation is the admonition, "relax." It has been noted that relaxation does not in itself create action, whereas muscular tension does. Therefore, the term "relaxation" refers to the relief of excessive tension caused by muscular effort.

Psychologists have pointed out that muscular tension is induced by mental processes and must be corrected by mental processes. The use of such processes is usually referred to as an Indirect Approach, but a deliberate mental decision to relax muscles suffering from excessive tension could also be considered as a Direct Approach. The term "psycho-physiological operation" is accepted by many as the correct definition of coordination. Thus, phonation is a result of both mind and physical movement. The correct definition of the term "coordination" is accepted by proponents of both Indirect and Direct Approaches. Advocates of both approaches recognize that singing is a result of motor performances with the brain controlling all physical functions of the singing mechanism.

It has been suggested that the singer needs to be cognizant of the sound the teacher is seeking. The singer then is advised to strengthen his memory traces regarding the sensations caused by the sound and the physical conditions of the body in order to reproduce the desired sound. Some kind of vocal model is often necessary to give the student the correct concept of the desired tone. Often the most desirable model is a sound the student makes himself. The teacher may find the desired sound by directing the student to make a variety of sounds by the use of selected words or vowels. When the student's most desirable sound is detected, he is directed to remember the sound and match other vowels with the selected sound to create an even vocal line. It is recognized that the selection of the student's best sound is often a very subjective process and will vary from teacher to teacher. Appelman has recorded vowel sounds by men and women to be

used as models in order to eliminate some of the subjective nature of selection. This approach is not without faults because no two voices are identical and forcing voices to match recorded sounds without considering the factors of maturity, training, and type might cause a student to produce sounds which could be harmful. Regardless of how the model is produced, the matching of vocal sounds may be learned by practicing at carefully spaced intervals of time, repeating the mental rehearsal of the motor acts until an adequate consolidation of memory traces can take place.

The physical characteristics as well as controls of the mouth, tongue, throat, and larynx are all considered important in the processes of phonation. Although the movement of the mouth is generally achieved by direct controls, the size and shape of the opening is determined largely by the kind of vowels to be sung, e.g., the open vowels require more mouth opening than the closed vowels. The student frequently needs to be reminded about relaxing the jaw and securing freedom in this part of the body. It is often suggested as important to release any built-up tension in the jaw, and the relaxing of the jaw is recommended to help create the desired opening of the mouth without rigidity. The exact size of the mouth opening is not generally established because individual mouths are different. It is recognized that beginners generally do not open their mouths wide enough for open vowels, and the placing of two fingers between the teeth to check the amount of opening has its merits; but sometimes a two-finger width is not enough and sometimes it is too much. Teachers have declared that some students have heard the general admonition to open their mouths wider and

responded with either too much or not enough opening. In such a case the teacher is advised to indicate to the individual student how wide his mouth should be, considering his personal characteristics and how the opening affects the tone.

Even though there have been differing opinions concerning the controls of the tongue, it appears that it would be a mistake to mention the subject to a beginner unless he had a serious problem. According to some, a fault concerning the action of the tongue is usually the result of an incorrect reflex action, and any corrective measures need long and careful supervision to correct. Indirect methods are often superior to direct methods concerning the correction of a tongue problem because direct changes need a corresponding amount of attention to ridding the tongue of excessive tension. Findings indicate that total coordination is the key to the most efficient use of the tongue.

It is interesting to note that there was little disagreement about the concept of the importance of the "open throat" either in the statements given by Fields or statements made in The Bulletin. It has become an accepted fact that the main cavities used for phonation are the throat and mouth, and the size and shape of these cavities are variable by various adjustments. Disagreement lay in the methods used to achieve an open throat and the remedy for a "throaty sound." Again, one of the most common terms used to relieve a "throaty sound" was the word "relaxation." Teachers said that when this term is interpreted as meaning "without effort," it does little good. The term "relaxation" was advocated as relevant only if understood in relation to ridding one's self of excessive tension. An acceptable method of achieving the

proper tonus for the throat during the act of singing was suggested as being accomplished by the maintenance of the same opening to the throat as experienced by the quick inhalation of a large amount of air. This suggestion used both the indirect method to open the throat and the direct method to maintain the same opening experienced by the quick inhalation. Another effective method of achieving the open throat was the use of the beginning of a yawn. Using the yawn as a means of achieving an open throat is both direct and indirect in nature: the yawn is a reflex action and therefore is indirect, but the Direct Approach is needed to suppress the full yawn and to retain the opening created by the preparation of the yawn.

The subject of laryngeal controls is also closely associated with the open-throat concept because the methods used to accomplish this technique, the quick inhalation or simulation of a yawn, causes the larynx to move downward and creates more room in the throat. The acceptance of the idea that the larynx moved at all was not a popular concept until scientific investigations proved that the low larynx was conducive to more efficient singing, especially in the upper range. Fields states that out of eighteen opinions expressed on the subject of laryngeal movement, half of them indicated there should be no movement. In contrast, there were twenty contributors to The Bulletin on this subject, and all of them indicated that there was some movement of the larynx during phonation.

A good deal of scientific knowledge about the nature of the "vocal attack" has been gained since Fields' work of 1947. Garcia was the main early investigator to contribute information about the

process of beginning a vocal sound, but many of his findings were misunderstood. We are indebted to Vennard for the clarification of many of Garcia's pronouncements and the continued interpretation of scientific findings since Garcia. Vennard's suggested method using the "imaginary [h]," which is conducive to creating a perfect synchronization of closing the valve and applying breath pressure, has been accepted by many as an effective procedure to improve a faulty attack. A faulty attack may also be caused by pausing between the act of inhalation and phonation. Some say that a soft rather than an abrupt attack is a more efficient way to begin a tone. It is generally believed that a coordinated effort of the muscles of the body should not only begin the tone but continue as the tone is sustained.

A combination of approaches has been useful in correcting problems of excessive tension caused by the exertion of too much pressure in any phase of phonation. The Direct Approach is involved in the act of creating exertion, and the Indirect Approach relieves the excesses of exertion. Many feel that the teacher is responsible not only for the correct physiological habits but for the development of the whole being related to the singing act.

The term "resonance" has been used to express a variety of different definitions, but scientific investigation shows that it is a condition or harmony of frequencies which exists between the vocal cords and the resonating cavities. At the first of the period covered by this study there were still some teachers of singing who were fighting the battle against those who would teach voice by "scientific methods." The movement against the "scientific" or "mechanistic"

approach started with Myer in the last half of the nineteenth century and reached its peak in the first half of the twentieth century. The anti-mechanistic adherents were against direct controls of any kind and claimed that the conscious manipulation of muscles caused excessive tension and therefore was not only undesirable but injurious. Those who favored the direct methods did use methods designed consciously to change the size and shape of the cavities responsible for resonation, but were not so dogmatic as many "indirect teachers" thought. For instance, direct methods were often suggested with the understanding that after the desired action was achieved, the student should produce such actions without conscious thought.

Many changes in concepts have been brought about by scientific findings and expanded knowledge concerning resonance in the past quarter of a century. The description and clarification of acoustical and physiological factors also often dictate the methods needed to acquire the desired resonance. Contributors to The Bulletin submitted articles describing the physical properties of sound, redefining the term resonance in ways to clarify and simplify the meaning for the average teacher of singing. It was assumed that the teacher with better understanding of the physiological factors of resonance was in a better position to deal with methodology in a more effective way.

Although Fields indicated a majority of opinions cited in his book favored the concepts that the head cavities were important, with the sinuses of particular value in creating resonance, contributors to The Bulletin provided contrasting views by de-emphasizing their importance. Similarly, the majority of opinions expressed before Fields'

publication indicated that "nasal resonance" was essential to a good tone, but research findings since 1947 have indicated that this concept is false. The sensations experienced in parts of the face cannot be described as resonance but rather are caused by the absorption and dissipation of vibratory energy. Thus, the nasal cavity is not a resonator which adds something but a filter which removes certain elements of the input mixture.

There were a number of contributors to The Bulletin who objected to the term focus because scientific investigation which explained how the ring to the voice was achieved proved that the literal usage of such a term was false. These findings prove that the ring to the voice is produced in the laryngo-pharyngeal resonator cavities producing strong overtones ranging from 2800 to 3200 cycles per second. Characteristics of a ringing tone are all the overtones as well as fewer formants containing more concentrated power. At times these conditions cause sympathetic vibrations which are felt in the bones of the face and head. The resulting quality has been described by many as being "bright" or "piercing." Even though the "mechanistic teacher" attempts to be completely objective in describing the singing act, he is forced sometimes to use subjective methods to teach the technique of acquiring ring to the vowel sounds. One method of securing the ring in singing is to have the student sustain the vowels of various words to see if he naturally produces a ring in certain words better than others. This is similar to the method suggested for finding a model sound for the student to match in the initial stages of phonation. Another subjective method preferred by some has been the

use of sensations experienced in the mask of the face by the use of the hum. When certain sensations are experienced, the student sometimes may profit from these experiences by adjusting his vocal mechanism to experience similar sensations as he endeavors to produce other sounds.

Views indicate that the use of pseudo-scientific terms such as focus and placement should be explained to the student as sensations rather than being thought of as literal in meaning. The teacher is advised to instruct the student carefully by making it clear when figures of speech or literal facts are presented. It is considered dangerous to use such phrases as "sing toward the corner of the room," "place the tone in front of the teeth," or "lean the tone firmly against the upper mask of the face" without indicating that such phrases are figures of speech, because the student might receive the false impression that the tone could literally be placed or directed. Many agree that the laryngeal functions responsible for the ring to the tone can be controlled directly and indirectly by the varied uses of the ear and sensations achieved by trial and error.

The use of the hum was associated with the concept of "nasal resonance" until scientific findings proved that the nasal cavities were of little consequence to the timbre of the tone. Of contrasts to the present view, twenty-five out of thirty opinions expressed in Fields' book favored the use of the hum as a useful device in obtaining an agreeable tone. Since Fields' publication, scientific investigation has proved that the cavities of the mouth and throat are the main cavities which determine the kind of quality a singer produces. The oral cavities have been measured and identified by name. Research

findings indicate that each cavity of the mouth and throat contributes a quality component to the tonal spectrum by being a part of a system which may be coupled with one another during the production of vocal sounds. When vibrations leave the larynx or generator, they can be reflected by firm surfaces, reverberate within a cavity, be transmitted through tissues to bony structures, or be absorbed. Soft-walled resonators can respond to many more different frequencies than hard-surfaced resonators. Differing qualities are caused by the way overtones are strengthened in different patterns for various vowels or dampened by friction in the vocal tract. Thus, the main difference between speaking and singing is determined by the amount of constriction along the vocal tract. While speaking requires a good deal of constriction, singing is accomplished by less constriction which allows high frequency overtones to pass through the resonating chambers. The degree of tonicity in the throat is partially responsible for the resulting reflection or absorption of tone. It is believed that the correct degree of tonicity can be achieved by stretching the walls of the throat, using a combination of approaches with such methods as the beginning of a yawn or quick inhalation, retaining the same firmness achieved by these techniques.

Another factor which determines vocal quality is the size and shape of the resonating cavities. Every change in the size or shape of the resonating cavities creates its own set of characteristic formant frequencies which determines the quality produced. The changes that are possible within the vocal tract are many, including the possible changes of the mandible, tongue, soft palate, or the movement of

the larynx. These changes can create a system of cavity coupling with vibrations in one cavity inducing vibrations in adjoining cavities. A cavity coupling system is referred to as tightly coupled or loosely coupled, depending upon the degree of constriction which causes either a tense vowel such as [e] or a lax vowel such as [a]. These changes can be accomplished by either a direct or indirect method, but they are most often changed by a combination of both methods. The methodology dealing with the mechanics of obtaining desirable tone quality are presented largely through the aids of hearing and sensations experienced by the student. Many agree that the ear is the primary point of control the student has in appraising his tone quality, and he should learn how to produce a quality with the most freedom and efficiency through the teacher's guidance.

There has been an important change in concept regarding the acceptance of the chest as a resonating cavity since the publication of Fields' book. The chest is not a cavity but is filled with soft spongy material. The assumption that the entire body is a resonator has also been discarded as being scientifically impossible. Although the trachea has been accepted by some as a resonator, the extent of its value is controversial.

Although Fields primarily discussed compass and registers of the voice under the heading of "Range," Modulation serves as a more accurate heading for the discussion of changing pitches, classification, compass, and registers of the singing voice. Until recently the meaning of pitch changes has been defined as resultant of change of one frequency to another, but now it is associated with intensity,

quality, and psycho-physiological characteristics. Thus, the singer is advised to control the relationship between the determinants of pitch in order to keep a tone consistently on the same pitch.

The area of vocal classification is usually paramount in the student's mind; however, several have indicated that there should be no urgency about classifying a beginning student. It is argued that since a premature diagnosis is often proved to be incorrect, a temporary classification may be made for teaching purposes with the understanding that maturity and training might change the classification. For years it has been accepte[illegible] the length of the vocal cords or the physical ch[illegible]an body indicated a particular vocal class[illegible]wo decades both of these concepts have b[illegible]t has been pointed out that some student[illegible].in a definite classification, but th[illegible]ourage the student because there is a wealth[illegible]: "in-between" voices. It is normal to develop as wide [illegible] as possible, but teachers are advised not to force the voice beyond the student's capabilities. Teachers are urged to be concerned about how well a person can sing rather than how high or low he can sing. Because nearly every singer is guilty of trying to sing louder, higher, and lower than nature intended, the teacher is warned to be watchful for undue strain and tension which might cause permanent damage.

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but when followed by experienced teachers, often attain good results. Serious errors in classification can result from the use of timbre as a sole criterion for classification because environmental influences can change the innate or natural quality of an individual. On the other hand, the scientific classification of voices is built on anatomic and phylologic basis such as the shape, size, and condition of the bucco-pharyngeal resonators as well as all other aspects connected with the formation and action of the larynx. Opinions indicate that the whole area of vocal classification should be approached with care because the voice evolves and changes regardless of preconceived ideas about classification.

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Many have tried to explain the causes of registers, but the most accepted theory was offered by Nadoleczeny and Zimmerman. This theory is based upon the assumption that each area of identical quality depends upon the adjustment of the resonating cavities. Wilcox and

Vennard have elaborated further on this theory, adding that the voice has two basic adjustments--one for high and one for low tones. The low tones depend upon a "heavy" mechanism and the high tones upon a "light" mechanism. The "breaks" in the vocal compass are explained as being caused by an improper or static adjustment of muscles which control the processes of phonation. The lower register covers the lower two-thirds of the compass, and the upper register applies to the upper two-thirds with at least an octave in the middle which may be sung in either register. Many believe that the "break" in the registers may be eliminated by strengthening the weaker muscles and approaching the lighter mechanism with less force. This process practiced over a period of time reportedly makes it possible to develop an equalization of muscles in both mechanisms so that the change from one mechanism to another is not abrupt. Opinions indicate that muscular adjustments must be accompanied by the correct adjustments of the resonating cavities.

An acoustical explanation of registers is also considered necessary because there is a relationship between the movement of certain harmonics which shift in and out of formant regions causing a change of one quality to another. Since the quality depends upon the size, coupling, and conditions of the cavities, the modification of vowels is also associated with register change. The combination of muscular adjustments and vowel modifications to blend the registers indicates that registration is a product of physiological and acoustical factors. It is concluded that the blending of the registers involves the correct adjustment of the larynx, flow of air, and the coupling of the larynx to itself.

Since Fields' publication, there has been an acceptance of the falsetto register as a legitimate and useful factor in the development of the complete range. Even though Ross presented scientific evidence that the upper register of the male and female voices were identical in operation, the majority of contributors to The Bulletin have continued to deal with the problems of blending registers of the sexes separately. The apparent reasons for this separation lies not only in acoustical differences but also in the unused registers which for the female voice is the chest register and for the male voice is the falsetto register. The female's unused register is often heavy and coarse and usually needs to be lightened to match her middle register. The male's unused register is light and often without muscular control which can be strengthened to match the chest register. Since vocal muscles are relatively relaxed in the male falsetto register, it is thought necessary to develop an intermediate or mixed adjustment between the chest and falsetto register in order to move from one to the other without a noticeable break. In order to make the transition, the student is urged to try some of the relaxation experienced with the falsetto adjustment, give more breath, and attempt to create room in the back of the throat as he nears the upper register. The reference to giving more breath at the transition point has been referred to as the "lift" in the voice which helps to keep the volume from diminishing. The opening of the back of the throat causes a modification of the vowels and accomplished what the "indirect teachers" refer to as "coloring" the upper range. The [u] vowel has been used with success in finding the intermediate adjustment often referred to as the man's head voice. The use of the

[hŋ] sound opening into the [ɑ] has been another useful method in achieving the intermediate adjustment. Both methods are direct in nature which may cause excessive tension; consequently, the indirect instruction of telling the student to "let go" of the neck and head is often helpful as he approaches the upper range. The preceding instruction is reportedly quite useful if the student is trying too hard. Some indicate that the upper register should be produced by a balanced and coordinated effort using the freedom of the falsetto as well as some of the muscular effort of the chest register.

The term cover was originally used to describe the technique of maintaining a low position of the larynx, producing a darker vowel as the high register was approached. Garcia and his pupil Marchesi used the terminology making the terms cover and mixing synonymous. The term cover was confused by some to mean that the whole vocal compass should be darkened instead of the upper register. This confusion caused some to abandon the usage of the term in order to avoid being misunderstood. Since most terms need to be explained to beginning students, it would be helpful to explain the meaning of discarded words and commonly used synonyms in order to eliminate as much misunderstanding as soon as possible within the vocal profession. Some who continue to use the term cover refer to the darkening of the tones in the transition area and the tones above this area. The closed vowels are considered by many as the best vowels to use in teaching the technique of covering. It is advised by a number of writers that the closed vowels be modified by opening the mouth as the scale is ascended, causing less closure. After the student has learned how to produce the "covered" sound, he

then is urged by the teacher to match the other vowels with the covered vowel by alternation. Most of the directions given for achieving the transition into the upper male register have been direct in nature, but the lowering of the larynx and the creation of roominess in the back of the throat may be accomplished by a combination of direct and indirect methods.

Husson has proved that a reduction of reverberation around the singer causes him automatically to compensate for the lack of reverberation by tubing or covering the tone. If his ear is not satisfied, the reflex action of covering is overdone, causing vocal fatigue and a distortion of tone. Under these circumstances it is suggested that the singer guard against oversinging by seeking the easiest production possible and be satisfied with less reverberation than expected under normal conditions.

There are also specific instructions for blending the woman's registers. The three-register concept is recommended as being especially useful in dealing with the woman's voice. The contralto often has a transition point into the chest register between the pitches of middle "C" and "B," whereas the soprano or mezzo-soprano has a similar transition a note or two higher. It is felt that the chest register is part of the female range and should be used in a modified form, using the quality of the tones just above the transition as a model for the tones below the transition point. A popular method for bridging the middle register with the chest register is to use descending scales, approaching the chest register with a reduction of force, lowering the jaw, and matching the chest quality with the quality of the middle

register. A woman often has a transition point between the middle register and the head register. The soprano's transition point is frequently found between the pitches of "F" and "G." Sometimes the transition point will appear only as a weak area of the voice with tones below and above produced well. The descending scale and the relaxed jaw are also suggested for blending this transition point. The use of the [ʌ] vowel has been recommended highly as a means of blending the middle and head registers.

It has been observed that the transition points can be approximated by generalities because there are similarities between human voices of the same classification. Some believe that the transition points are not "fixed" so that it would be a mistake to expect every student to respond in the same way or have transition points between the same pitches just because the majority do. The same is true concerning methodology. Students respond to direct and indirect instructions in varying ways. If a student is unable to respond to a particular method, the use of another method is recommended. Because students do not have the same problems, the teacher is urged to determine the need and instruct the student in ways which will affect the desired changes. It is agreed that the student cannot hear himself as others hear him; therefore, he is not capable of making the necessary changes to produce his best quality.

One of the problems which has created a partial gulf between the Indirect and Direct Approach is the human tendency of placing other teachers into categories. If a teacher uses a particular method or employs the use of a word associated with a specific school of thought,

it is a human trait immediately to categorize him. The harm of such snap judgments has caused needless divisions and misunderstanding; e.g., some misunderstanding has resulted from persons using the term "one-registered voice." The immediate association is the "idealistic" philosophy with its most fantastic definition, which indicates that if a singer has a positive attitude, problems will disappear. A neophyte influenced by this type of definition of the "idealistic" philosophy could be attracted to the Direct Approach and shun everything and every word used by those who advocate the virtues of the Indirect Approach. Students with vocal problems are often drawn by the Direct Approach because this approach suggests that positive actions will be used to correct faults. A middle-of-the-road policy has been suggested to combat this dilemma, for knowledgeable teachers have found that both the Indirect and Direct Approaches are needed to overcome vocal faults.

Since artistic singing is the result of mental processes which stimulate physical responses, the mind is understood to be the major factor in achieving the proper coordination of the physical techniques of singing. Opinions indicate that it is the teacher's responsibility to develop the skills necessary for these physical responses with methods which are directed to the mind of the student. The human mind is so complex that it is difficult to establish how a human will respond to certain directives. Teachers have found that every time a student comes into a vocal studio they are faced with a new challenge--finding the procedure which will promote understanding and produce results. Sometimes a student can only be taught by ridiculous

exaggerations or by repetition while another may understand after a few words of instruction. In the field of vocal education there seem to be few absolutes. Many believe the final goal of the teacher is to teach the student how to control the processes of singing so that he may be as consistent as possible in his performances. Some excellent teachers believe that the student should not be aware of the physical process of singing because calling attention to the physical aspects of singing will often cause localized tension. It should be obvious that there are a number of successful methods which seem to be opposed to each other. Observations indicate that one reason the differing methods continue to produce agreeable results lies in the fact that each student is an individual who responds in various and unpredictable ways to instruction. It is noted that human beings have varying degrees of conscious control over their functional parts as well as varying temperaments and emotional sensitivities. Views expressed agree that the human voice is a complex instrument which is affected by every mental, physical, and emotional influence in varying proportions. With the realization that individuals respond in varying ways, the consensus of vocal teachers indicates that effective teaching depends upon the use of both the Indirect and Direct Approaches.

Recommendations for Further Study

Although much has been learned about the processes of singing since the 1940's, there is much that is still unknown. There are also a number of questions which have received attention in the past but have not been answered to the satisfaction of everyone. Such is the

case regarding the need to re-evaluate the importance of imitation as an aid in learning how to sing with an acceptable quality. Many use imitation freely as an aid, demonstrating with their own voices, but insist that it is dangerous to imitate another voice. Likewise, much has been learned about the role that personality traits of both students and teachers play in determining learning progress; however, the amount of information about individual differences, moods, temperaments, ambition, and phobias in successful voice pedagogy is still rather limited.

More research is needed to provide additional techniques for controlling what were previously thought of as involuntary actions of organs and muscles. Controls of involuntary muscles and organs have been affected by certain mental directives, but much is still unknown as to how much exertion is needed and if the proper exertion is achieved. This indicates the need for more accessible devices which can measure how much muscular effort is exerted in each phase of phonation. Along with such information it is readily perceived that additional research is needed to determine immediately useful data regarding quicker and more efficient methods of teaching each technique of singing. This might also include techniques to determine the sensitivity differences between excellent and poor singers. Although aptitude tests have been devised in the past, further research might produce tests which would determine more accurately the general aptitudes necessary for students wishing to successfully study singing as an art. A continued investigation in the form of a comparative analysis of the various boundaries of good taste regarding singing quality, interpretation,

and literature would profit both students and teachers of singing. Efforts are also needed to continue the translation of scientific discoveries into understandable language and techniques for teaching singing.

Teachers hold varying opinions regarding the responsibility of the teacher of singing in teaching vocal pedagogy in singing lessons. Surveys could show how many teachers of singing feel a responsibility for incorporating the study of vocal pedagogy in their regular teaching procedures. Such a survey could indicate the prevailing opinion as to whether every college vocal major should be prepared to teach voice; also it might show how many professional singers presently teaching voice have been prepared to teach in their regular vocal training. Tests indicating the extent to which vocal pedagogy is learned in three years of college voice instruction could indicate the student's deficiencies. A current survey indicating how many teachers have a required reading list of books on singing incorporated in their four-year curriculum of vocal instruction might be enlightening. Perhaps a list of the most respected books used as references would be valuable to teachers in general. Further studies are needed to indicate how to make current information about the teaching of singing more accessible to teachers of singing. Studies might determine how more dialogue between a greater percentage of teachers of singing could be accomplished to lessen misunderstanding. Such studies might indicate how the university could become more effective as a counseling center for private teachers of the community and state.

It is dangerous to become set in one procedure of teaching because, even though it may be successful, better and more effective

methods may be discovered. It is important to continually investigate accepted theories because as new knowledge is gained, conclusions change. Not only is change in vocal pedagogical procedures inevitable but often it produces contrasts. Wise teachers may promote understanding of resulting contrasts by keeping abreast of changes in vocal pedagogy.

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APPENDIX

The following is a list of International Phonetic Alphabet symbols used in this study.

I.P.A. Symbol	Key Words
æ	hat, plaid
ɑ	father, sergeant
a	lamb
e	ate, rain
i	Caesar, team
h	hit, who
m	calm, more
n	gnat, not
o	oh, beau
ŋ	ring, tongue
u	grew, move
ʌ	does, cup
ə	alone, dungeon